Journal OF THE AMERICAN DIETETIC ASSOCIATION

VOL. 24, NO. 11 NOVEMBER 1948

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Paul R. Cannon, M.D.

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B. S. Schweigert

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Helen E. Walsh, President of the American Dietetic Association

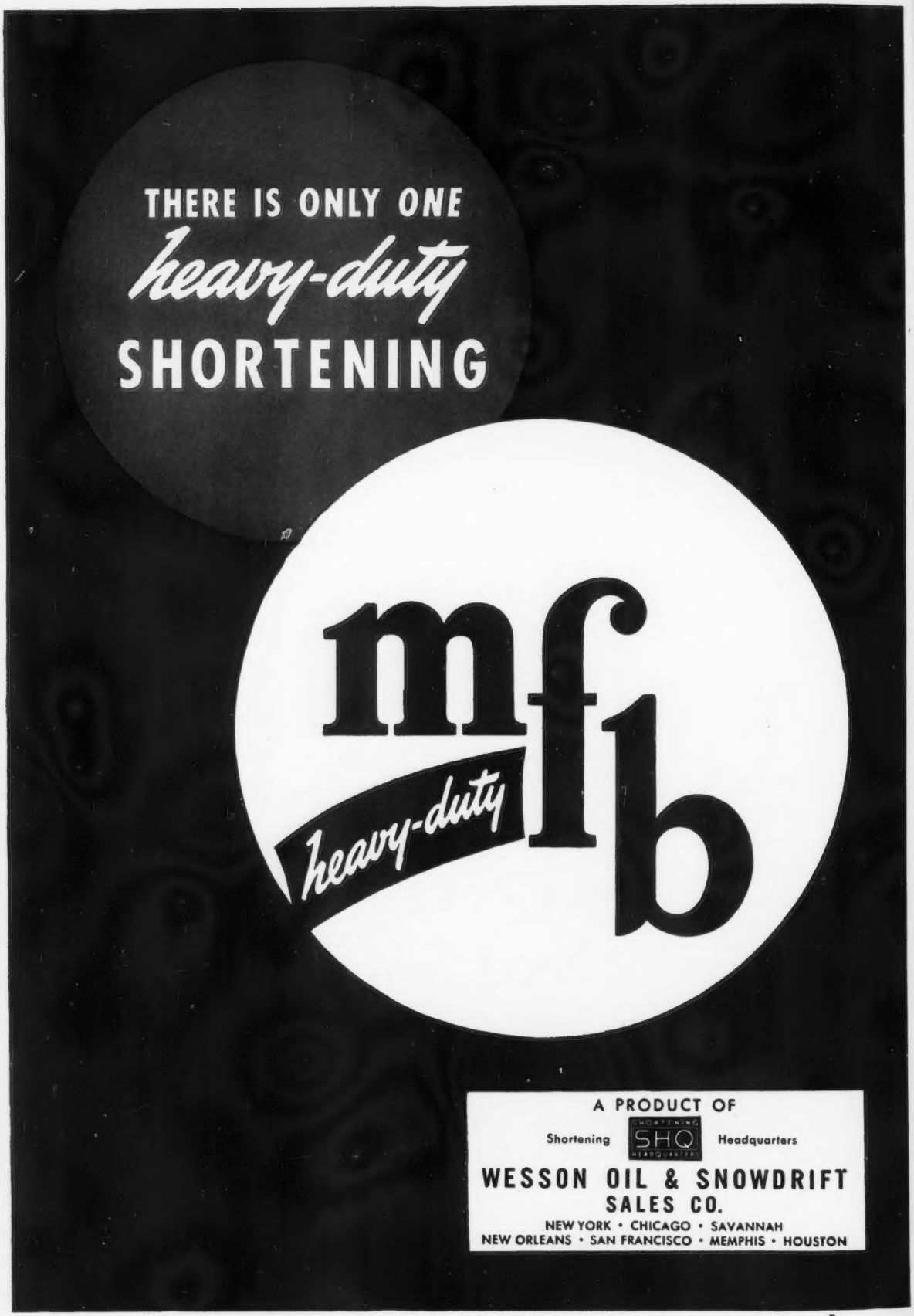
The Dietitian and Her Community

Cleveland Dietitians Work with Hospital Council

The Early Days

A.D.A. Annual Meeting, Denver, October 10-14, 1949

Published by THE AMERICAN DIETETIC ASSOCIATION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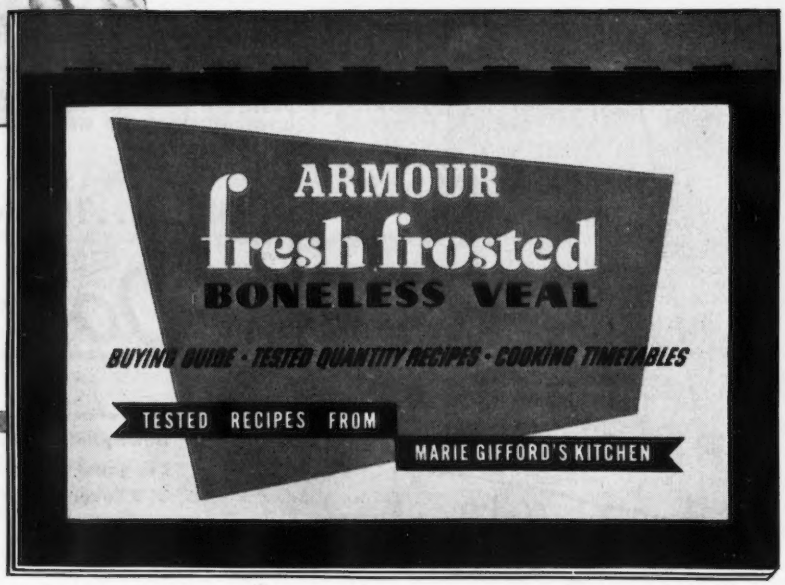

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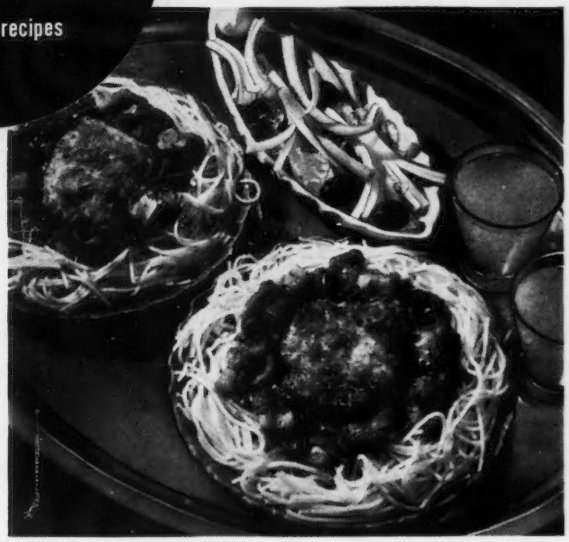
3. Place steaks in baking pan. Add tomatoes and seasoning. Cover tightly and cook one hour or until tender.



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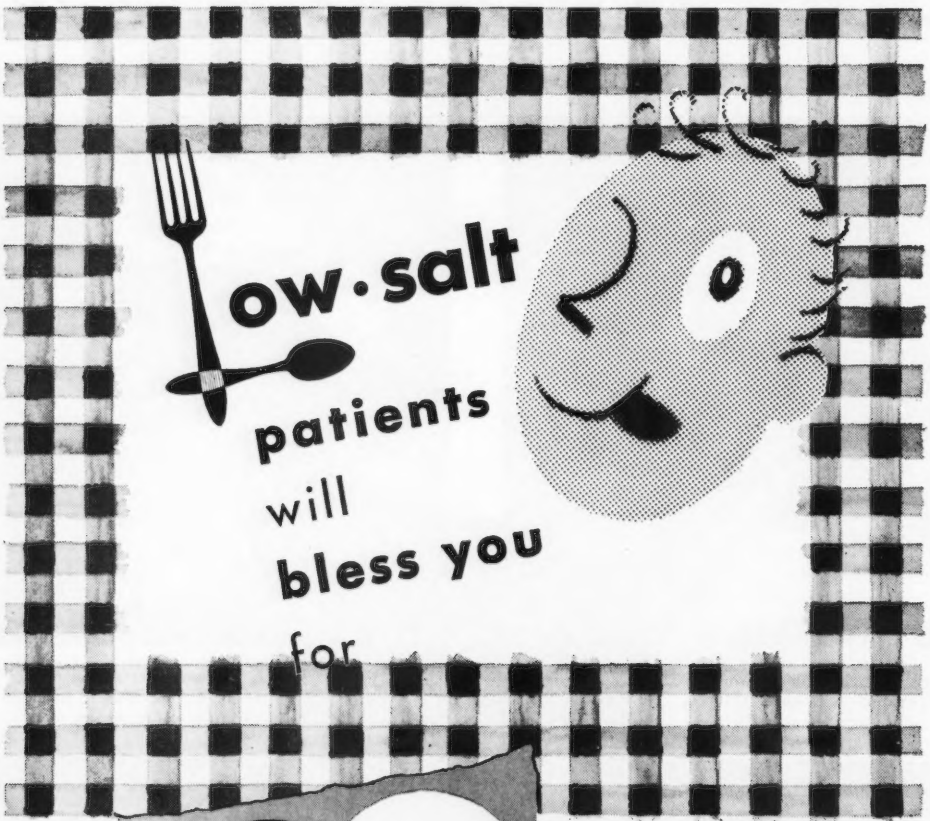

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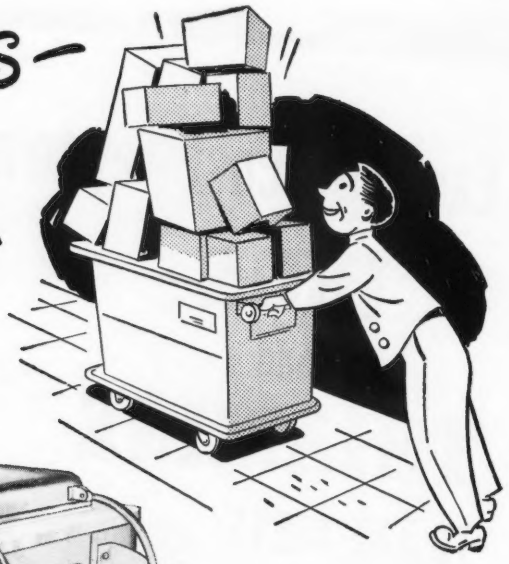

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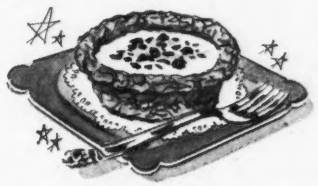

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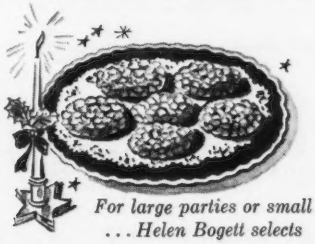

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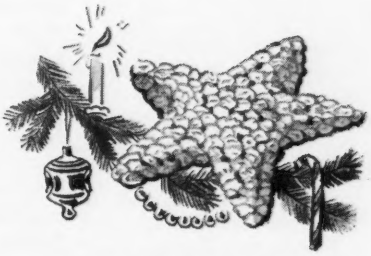

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In Nutrition Rehabilitation... A Good Start

Any sound nutrition rehabilitation program starts with an adequate breakfast. Important as is an adequate breakfast in normalcy, doubly so is its importance in convalescence when reconstruction of body tissues and functioning hinges largely on nutrition. During recovery periods from disease, it is virtually mandatory that the dietary burden of the day be equally distributed over the three meals, hence breakfast becomes especially an important meal. Overtaxing the patient's digestive capacity is thereby avoided; an even flow of essential nutrients is made available for supporting the metabolic processes of rehabilitation.

As a means of assuring breakfast adequacy, a widely endorsed basic breakfast pattern is used. Consisting of fruit, cereal, milk, bread and butter, it forms a sound foundation upon which to plan the morning meal. Other suitable foods can be added if required by the situation at hand.

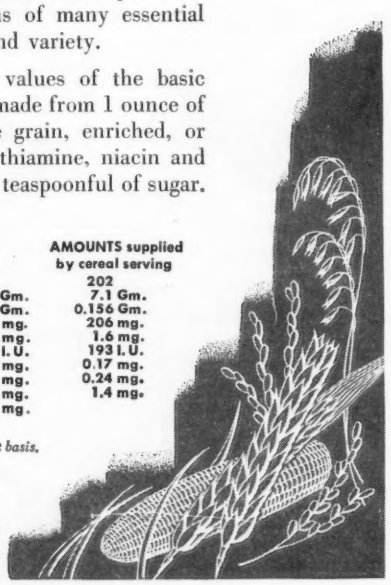
Because of its many nutritional and dietetic values, the cereal serving—hot or ready-to-eat breakfast cereal, milk, and sugar—is extensively recommended as the principal dish of this basic breakfast pattern. This cereal serving, rarely contraindicated and widely applicable, lends itself especially for use in rehabilitation dietaries. It provides, along with significant contributions of many essential nutrients, appetizing tastefulness and variety.

The table depicts the nutrient values of the basic breakfast and of the cereal serving made from 1 ounce of ready-to-eat or hot cereal* (whole grain, enriched, or restored to whole grain values of thiamine, niacin and iron), 4 fluid ounces of milk, and 1 teaspoonful of sugar.

The presence of this seal indicates that all nutritional statements in this advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

BASIC BREAKFAST	TOTALS supplied by Basic Breakfast	AMOUNTS supplied by cereal serving
Orange juice, 4 fl. oz.; Ready-to-eat or Hot Cereal, 1 oz.; Whole Milk, 4 fl. oz.; Sugar, 1 teaspoon; Toast (enriched, white), 2 slices; Butter, 5 Gm. (about 1 teaspoon); Whole Milk, 8 fl. oz	CALORIES..... 611	202
	PROTEIN..... 20.7 Gm.	7.1 Gm.
	CALCIUM.....0.465 Gm.	0.156 Gm.
	PHOSPHORUS .... 488 mg.	206 mg.
	IRON ..... 3 mg.	1.6 mg.
	VITAMIN A..... 1074 I. U.	193 I. U.
	THIAMINE..... 0.52 mg.	0.17 mg.
	RIBOFLAVIN..... 0.87 mg.	0.24 mg.
	NIACIN..... 2.3 mg.	1.4 mg.
	ASCORBIC ACID .. 64.8 mg.	

**Composite average of all breakfast cereals on dry weight basis.*



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Changing Concepts of Protein Utilization in Nutrition

PAUL R. CANNON, M.D.

Department of Pathology, University of Chicago

THE unusual interest today in the role of dietary protein, coming as it has after more than a decade of exceptional interest in vitamins, is largely a result of a process of "catching up" on our knowledge of the importance of proteins in nutrition. The newer information concerning amino acid utilization, particularly in its relationship to the expanding dietetic use of protein hydrolysates, protein concentrates, and protein supplements, has created new problems whose solution can be arrived at only by a clearer understanding of the varying needs for dietary protein. These needs differ considerably in health and disease. Information concerning the daily *maintenance* requirements for protein in a healthy person will be of little value in predicting the needs of a protein-depleted patient, for in disease the needs are related both to its severity and duration. In consequence, tissue reconstruction in the process of convalescence will necessarily vary from patient to patient. Fortunately, however, a few guiding principles are now discernible which help to insure greater efficiency in the utilization of dietary protein.

ROLE OF PROTEIN IN TISSUE BUILDING

It is now obvious, for example, that protein foodstuffs are of primary importance in nutrition because of their contribution to the processes of tissue construction and reconstruction, whether in relationship to growth, pregnancy, lactation, maintenance, or the rebuilding of injured or depleted tissues. In the course of, or following tissue loss, whether due to infection, trauma, burns, or metabolic disease, amino acids derived from the digestion of proteins constitute the constructive units essential for tissue replenishment. Because of this, they should not be diverted from their primary function to be used as units of energy exchange. Nevertheless, it has long been the custom to calculate the caloric value of a diet in terms of carbohydrate, fat, and protein, even though protein as a source of calories is expensive and, in addition, amino acids utilized as a source of calories cannot simultaneously function as building stones for the synthesis of tissue protein. Furthermore, since the usual steady rate of turnover of amino acids in the course of tissue degradation becomes accelerated in times of stress, larger quantities of amino acids must be made available to the tissue-synthesizing mechanisms in order to counteract the catabolic processes. This applies to conditions such as anemia, hypoproteinemia, muscle atrophy, diminished enzyme activity, impaired antibody fabrication, or other conditions. Reversal of such processes can be accomplished only by provision of an adequate supply of all amino acids, particularly essential amino acids, to the sites of synthesis.

So far as is now known, the source of these amino acids is immaterial, i.e., whether from animal or vegetable protein, protein hydrolysates, or concentrates, provided (a) that all the amino acids, both essential and nonessential, are available in proper proportions and amounts and (b) that they are absorbed from the digestive tract at approximately equal rates. With animal proteins both provisions are operative. In some vegetable proteins, however, there is suggestive evidence that, due to processing injury or because of unequal availability of individual amino acids, absorption may vary enough to hamper the efficient utilization of the total assemblage of amino acids for purposes of tissue synthesis. In fact, the poorer performance of some vegetable proteins may be due, in part at least, to this variability of absorption brought about by unequal rates of enzymic liberation of essential amino acids from the digestive tract. At any rate, if the digestive processes are reasonably efficient, an adequate assortment of absorbed amino acids can be secured no matter whether they are derived from natural protein, predigested hydrolysates, or protein concentrates. In other words, high quality protein *per se* insures an adequate supply of all amino acids needed for bodily purposes.

REQUIREMENTS FOR PROTEIN IN HEALTH AND DISEASE

Assuming the availability of a good source of dietary protein, the next problem is: What are the daily needs for protein in health and in disease? In health, it is now evident that, for adult maintenance,

as little as 30 gm. per day or even less, is adequate, at least for short intervals. However, except in times of urgent need and in cases where survival is the principal issue, few would recommend such a low intake of protein. As a reasonable factor of safety, therefore, the Food and Nutrition Board of the National Research Council has recommended a daily allowance of 1 gm. of protein per kilogram of body weight. This amount is sufficient in most circumstances for the maintenance of health. Furthermore, a daily diet containing this quantity of high quality protein is not difficult to obtain in natural foods alone.

In disease, however, the problem is more complicated. Depending upon the severity of the pathologic process, catabolism may exceed anabolism to such an extent that tissue loss can be arrested or corrected only by a generous intake of high quality protein. And at times even high-protein intakes cannot compensate for the loss of tissue protein, as, for example, during the so-called "catabolic phase" in the course of severe infection or trauma. In marked protein depletion, for example, the daily "needs" for essential amino acids in order to insure effective tissue synthesis may be fivefold those for maintenance. Under these circumstances an intake of at least 150 gm. of protein per day may be necessary, and the use of protein supplements offers advantages in dietetic management.

PALATABILITY AND COST OF PROTEIN SUPPLEMENTS

Before using protein supplements, however, the questions of palatability and cost should be carefully considered. It has been difficult thus far to prepare protein hydrolysates for oral use which are attractive in taste and acceptable to ill patients. Moreover, there is as yet no convincing evidence that the oral administration of predigested protein offers important advantages over the use of natural protein, although it is too early to be dogmatic in this respect. The burden of proof is upon those who advocate the use of predigested milk protein, for example, in preference to skim milk powder alone. Where cost is of no consequence, some pharmaceutical preparations offer convenience and acceptability. It is important, nevertheless, in many instances, to consider the problem of cost in the use of these preparations. For example, skim milk powder can furnish high quality protein at a cost of one-tenth to two-tenths of a cent a gram for protein. Thus 100 gm. of protein supplement need cost but 10 or 20 cents a day. In contrast, some commercial protein preparations may cost as much as 2 cents a gram for protein, which would amount to $2 a day for 100 gm. This simply adds to the already high cost of medical care without affording additional nutritive value.

INTERRELATIONSHIPS BETWEEN PROTEINS, CALORIES, AND VITAMINS

Accumulating investigations point more and more to the nutritional interrelationship between proteins, calories, and vitamins. Vitamins are no longer thought of exclusively in terms of deficiency symptoms; rather, they are now seen to be parts of enzyme systems which participate actively in metabolism. It is of particular interest that the high quality proteins, such as meat, milk, and eggs, contain significant amounts of important vitamins, such as riboflavin, niacin, thiamine, and so on. So far as utilization of protein is concerned, there is abundant evidence that some of these vitamins play an important part in the utilization of amino acids for purposes of tissue synthesis.

Finally, recent evidence demonstrates definitely the vital role of calories in the course of dietary utilization of ingested protein. For example, it has been shown in protein-depleted rats that the efficiency of utilization of amino acids increases to an optimum as caloric intake increases but that, above a certain point, additional calories no longer favor the processes of tissue protein synthesis, promoting, instead, the deposition of body fat. This means that, whereas caloric intake must be adequate for maintenance needs, and with a little to spare, a high caloric diet is not necessary for adequate protein nutrition, provided the protein ingested is of high quality and is eaten at a level approximating 1 gm. of protein per kilogram of body weight per day.

From this brief consideration of the role of proteins in nutrition it can be seen that the prevailing emphasis today is more upon adequacy than overabundance. Protein quality is now evaluated mainly in terms of amounts and availability of essential amino acids in the protein. Bodily protein needs, also, are estimated especially in relation to the particular needs of various systems for essential amino acids. It is becoming more and more apparent that these needs vary in relation to the severity of the pathologic process and the degree of protein depletion. Particularly important is the evaluation of dietary essentials—amino acids, vitamins, calories, and minerals—in their interrelationships to overall metabolism. Finally, such important questions as palatability and cost cannot be ignored. Proteins are expensive dietary constituents and should be utilized as economically as possible if they are to accomplish maximal nutritional good at a minimal cost.

The average American today eats about $1\frac{1}{5}$ lb. nut meats a year, as compared to $\frac{4}{5}$ lb. in 1909, according to the Bureau of Agricultural Economics. The production of the four principal nut crops—almonds, filberts, walnuts, and pecans—is now about 348 million lb. In 1909, it was 23 million lb.—*From New York Times, February 29, 1948.*

Amino Acid Content of Foods

B. S. SCHWEIGERT

Division of Biochemistry and Nutrition, American Meat Institute Foundation, University of Chicago

IN EVALUATING the adequacy of mixed diets and the composition of individual foods, accurate data are important. During the last several years much effort has been directed toward assembling and evaluating existing data on the major nutrients in foods, especially the B vitamins. Several agencies have been particularly active not only in assembling these data, but in appraising the work done and indicating that much more needs to be done.

The development of new research techniques for the determination of amino acids has already demonstrated that similar evaluations on the amino acid content of a wide variety of foods can be accomplished in the near future. Thus, as more data on the requirements of individual amino acids for man and for other animals become available and data on the amount and availability of amino acids in foods are accumulated, a more precise evaluation of the adequacy of the protein intake can be made in terms of individual amino acids.

In the present review will be discussed the results obtained with the use of microbiological methods in (a) studies to determine the amino acid content of foods, (b) studies on the metabolism of amino acids by the animal, (c) studies on availability of ingested amino acids to the animal, and (d) studies on the metabolic processes of amino acid synthesis and utilization by the test microorganisms.

Methods for the determination of amino acids by the use of microorganisms, particularly of the lactic-acid-producing strains, have been developed during the past five years. This work was facilitated greatly by experience obtained with the general techniques and the nutritional requirements in the course of the wide use and acceptance of these organisms for determinations of B vitamins. The most commonly used test organisms are *Lactobacillus arabinosus*, *Streptococcus faecalis* R, and *Leuconostoc mesenteroides* P-60. For certain amino acid determinations *Lactobacillus delbruckii*, *Lactobacillus fermenti* 36, *Lactobacillus casei*, and *Neurospora* or *Escherichia coli* mutants have been used. The techniques used, preparation of samples, factors involved in the precision of the analyses, and suitable media for testing have been reviewed elsewhere (1–3). The accuracy and dependability of the assays have also been discussed and will not be reviewed here.

AMINO ACIDS IN FOODS

Following studies on the qualitative and quantitative requirements for the amino acids, the adaptation of these techniques to the quantitative determination of amino acids in proteins and foods was reported in several papers during 1943 and 1944 (4–11). Of particular importance was the fact that the microbiologic assays were well adapted to the determination of leucine, valine, and isoleucine, for all of which adequate chemical methods had not been available. Also, the use of these methods made it unnecessary to remove extraneous fat and carbohydrate before analysis, because the samples of the foods may be hydrolyzed without previous treatment and the amino acid content determined. Since these initial observations, the studies have been extended and most of the amino acids can now be determined microbiologically, and the values obtained are in good agreement with other accepted methods. Considerable data are now available on the amino acid content of purified proteins, such as casein, lactalbumin and lactoglobulin, serum albumin, gelatin, and hemoglobin. In addition, several laboratories have tested the methods for the determination of amino acids in foods and, although the data are by no means complete, sufficient progress has been made to demonstrate the usefulness of these methods and to form a basis for evaluation of protein foods and for the need for additional data.

Table 1 gives a summary of values obtained for leucine, valine, isoleucine, threonine, methionine, lysine, arginine, histidine, phenylalanine, and trytpophan in several products, namely, milk, beef muscle, beef liver, whole egg, soybean meal, whole wheat, whole corn, and peas (12–33). The data

presented are based on the percentage of the amino acid in the crude protein (16 per cent nitrogen). From the protein content, one can readily calculate the percentage of each amino acid in the food itself and consequently the amount present in average servings. Rather good agreement has been obtained for most of the amino acids by workers in different laboratories using different assay conditions and different samples. Some of the discrepancies can be attributed to limitations in the methods as used in the earlier work that have become apparent in subsequent studies. The main factors that account for these discrepancies have been in the techniques of hydrolysis of the sample, in the ability of the test organism to synthesize a part of the requirement for the amino acid being studied, or to imbalances or other limitations of the media resulting in incomplete utilization of the test amino acids (13, 26, 34–37).

Although the data are rather limited in several instances, the animal products are shown to be excellent sources of the amino acids. Qualitatively, proteins of muscle and organ meat have a very similar composition; in fact, little variation has been noted in the amino acid contents of muscle or organ meats from pork, beef, or lamb. Certain differences have, however, been noted in the case of the histidine and lysine content of different muscle or organ tissues (27, 30). It would be pertinent to determine the amino acid composition of the proteins of the different cell fractions (nuclei, mitochondria, and so on) which undoubtedly would reveal differences in protein composition. Such a study would be well suited to microbiologic methods.

TABLE 1

Amino acid content of foods as per cent of the crude protein*

AMINO ACID	MILK**†	BEEF MUSCLE**	BEEF LIVER*	WHOLE EGG**	SOYBEAN MEAL**	WHOLE WHEAT**	WHOLE CORN**	PEAS*
Leucine	9.7 (15) 9.9 (16) 11.8 (33)	7.7 (12) 7.7 (21) 8.4 (31)	8.4 (12) 8.3 (16)		7.1 (15) 7.4 (16) 7.9 (19)	5.6 (15) 6.8 (16)	9.6 (15)	6.9 (15) 6.4 (16)
Valine	7.9 (15) 6.6 (16) 6.9 (18) 6.2 (33)	5.1 (12) 5.9 (18) 5.2 (21)	6.2 (12) 5.7 (16)	6.9 (18)	5.1 (15) 4.6 (16) 5.5 (19)	4.8 (15) 4.5 (16) 4.1 (18)	5.2 (15) 5.3 (18)	5.4 (15) 4.0 (16) 5.4 (18)
Isoleucine	5.6 (15) 5.2 (16) 6.5 (33)	5.9 (12) 5.3 (21) 5.3 (31)	5.6 (12) 4.0 (16)		5.0 (15) 4.5 (16) 5.6 (19)	3.8 (15) 3.6 (16)	4.1 (15)	5.2 (15) 4.1 (16)
Threonine	4.0 (16) 5.2 (25) 3.7 (20) 4.8 (33)	5.4 (21) 3.7 (28) 5.8 (25) 4.3 (30)	3.8 (16) 4.5 (24) 4.3 (30)	5.8 (25)	3.9 (16) 4.1 (19) 3.3 (20) 3.9 (24)	2.5 (16) 2.1 (20) 3.0 (25)	3.1 (20) 3.9 (25)	3.9 (16) 4.0 (20) 4.2 (25)
Methionine	2.1 (16) 2.2 (17) 2.2 (33)	2.8 (17) 2.5 (29) 2.2 (30) 2.4 (31)	2.0 (16) 2.2 (29) 2.3 (30)	2.7 (17)	0.84 (16) 1.4 (19) 1.8 (28)	1.2 (16) 1.0 (17)	1.4 (17)	0.43 (16) 0.96 (17)
Lysine	8.7 (16) 7.1 (23) 7.4 (20) 8.1 (33)	7.9 (21) 10.0 (23) 8.0 (30) 8.5 (31)	6.1 (16) 7.0 (30)	7.8 (23)	5.4 (16) 6.2 (19) 5.7 (20)	2.9 (16) 2.4 (20) 2.0 (23)	2.3 (20) 2.3 (23)	5.0 (16) 5.8 (20) 6.5 (23)
Arginine	3.6 (16) 3.6 (20) 3.5 (33)	6.0 (21) 6.8 (30)	3.4 (16)		7.1 (16) 7.3 (19) 7.1 (20)	4.2 (16) 4.1 (20)	4.3 (20)	8.9 (16) 5.4 (20)
Histidine	2.4 (16) 2.5 (22) 2.3 (20) 2.4 (33)	3.5 (21) 2.0 (22) 4.0 (27) 3.2 (31)	1.9 (16) 2.6 (27)	2.3 (22)	2.3 (16) 2.5 (19) 2.1 (20)	2.0 (16) 1.4 (20) 2.0 (21)	2.4 (20) 2.2 (22)	1.2 (16) 2.6 (20) 2.9 (22)
Phenylalanine	4.5 (15) 5.3 (16) 4.6 (33)	3.7 (14) 3.9 (21) 4.1 (31)	4.3 (14) 5.3 (16)		4.5 (15) 5.3 (16) 5.0 (19)	4.4 (15) 5.1 (16)	4.3 (15)	5.0 (15) 4.4 (16)
Tryptophan	1.32 (16) 1.40 (33)	1.11 (13) 1.30 (14) 1.17 (32)	1.60 (13) 1.60 (14) 1.38 (16) 1.50 (26)		1.20 (16) 1.65 (19) 1.64 (26)	1.37 (16) 0.97 (32)		0.71 (16) 0.91 (32)

* The crude protein content is based on 16 per cent nitrogen.
** The references are given in parentheses.
† Values are included for whole milk, dried whole, or skim milk.

Soybean meal and peas have a somewhat lower content of methionine and lysine and slightly higher content of phenylalanine than the animal products, while the cereal grains are particularly low in lysine and also low in methionine. More critical comparisons of the values presented can be made with the accumulation of further data. Some data on other food products are also available (12–33). As more work is done, it will be possible to calculate the amino acid content of mixed diets from data obtained on individual components, and with improvements in the methods of analysis more precise study of the actual variation in amino acid content of foods due to stage of maturity, processing, and differences in strain can also be made. Data on the amino acid content of diets determined by analysis and by calculation from the content of individual ingredients have been shown to agree well (15, 20).

Modifications in the techniques of analysis have also been introduced to save time in the routine operations and to reduce the operations to a micro scale (2 or 0.2 ml. volume) in order to conserve a limited amount of an available sample of blood or of other body fluids (38–40). These adaptations are also valuable for studying the amino acid composition of purified proteins which may be available in limited quantities. For example, studies of the amino acid composition of crystalline lipoxidase have been successfully carried out with the micro-techniques, and a rather complete analysis can be made with 10 to 30 mg. of protein (41).

UTILIZATION OF AMINO ACIDS

The microbiologic methods have recently been introduced for studies on the effect of the protein intake on the amount of apparent free amino acids in blood and urine (40, 42–50). The term "apparent free amino acids" refers to the amino acids present that are microbiologically available without hydrolysis of the sample. Such tests have shown that the level in blood and urine is correlated with the dietary intake. Data obtained after hydrolysis of urine showed that one-half to three-fourths of the total amino acids excreted was not microbiologically available, that is, was present in a bound form (40, 44, 49). From less than 1 to 5 per cent of the ingested amino acids were excreted in the urine when normal diets were fed. Although the amount excreted per day reflected the dietary intake, the percentage of the ingested amino acid which was excreted was quite constant (Table 2). It is also of interest that the mouse excreted a higher percentage of the ingested amino acids than did the rat. When vitamin- or amino-acid-deficient diets were fed, the urinary excretion of certain amino acids by the rat was somewhat increased (44), while the urinary loss by mice fed tryptophan- or methionine-deficient diets was increased to an average of 37.3 per cent of the intake (50).

Similarly, studies on the total amino acid excretion in the feces and urine offer a great deal of promise as a refinement of the nitrogen balance methods for determining nitrogen utilization. Other studies have shown that a reduced retention of nitrogen by the animal, when certain protein products were ingested, was not the same for all of the amino acids. For example, the availability of arginine from cottonseed flour was shown to be 93.4 per cent while the lysine availability was only 64.5 per cent. The availability of both amino acids approached 100 per cent, however, when meat protein was fed (52). It has also been shown that when fish meal or soybean meal was included in diets adequate in all nutrients except tryptophan, the tryptophan in these products was not completely utilized for growth by chicks (53). This technique as a basis for studying availability requires not only that the amino acid must be absorbed, but it must be utilized effectively for protein synthesis (i. e., it must promote growth). Undoubtedly microbiologic techniques will be used for further work in studying the effect of diet and processing of foods on the amino acid retention by the animal. The methods are quite reliable for determining the amino acids in blood, urine, and feces, and are sufficiently sensitive to measure the small amounts present in the microbiologically available form. Although certain peptides are microbiologically active (2), these techniques are also valuable for studying the rates and degree of proteolytic digestion and afford data on the comparative rates of release of individual amino acids (6, 28, 54).

TABLE 2

*Effect of protein intake on the urinary excretion of certain amino acids by the rat and mouse**

AMINO ACID	10% CASEIN DIET		50% CASEIN DIET	
	Amino acid excreted per day	Ingested amino acid excreted	Amino acid excreted per day	Ingested amino acid excreted
Rat				
	mg.	%	*mg.*	%
Tryptophan	0.17	1.90	0.48	0.80
Valine	0.51	0.60	0.87	0.21
Lysine	0.30	0.31	1.04	0.22
Glutamic acid	3.80	1.40	11.59	0.87
Mouse				
Tryptophan	0.10	5.1	0.59	5.9
Valine	0.54	2.5	2.68	2.5
Lysine	0.53	2.1	2.52	2.1
Glutamic acid	2.52	3.6	11.30	3.2

* The values are for microbiologically available amino acids and are summarized from papers by Schweigert *et al.* (43) and Sauberlich and Baumann (40).

Commensurate with these studies, valuable information has been obtained on the utilization of specific amino acid derivatives by the test organisms; biochemical mechanisms of amino acid synthesis; and, with the chemically defined medium used, information on the existence of unknown growth factors has also been obtained. A few examples follow to indicate the progress made along these lines.

Numerous examples of a difference in the utilization of amino acid derivatives by different microorganisms have already been reported. Perhaps one of the most interesting involves the utilization of tryptophan derivatives. Recent studies (55) demonstrated that D-tryptophan, the unnatural isomer, is not only not utilized by *L. arabinosus* for growth, but may inhibit the effective utilization of L-tryptophan, the naturally occurring isomer. Conversely, L-tryptophan is completely utilized by *S. faecalis* R in the presence of D-tryptophan. Thus, it is apparent that when basic hydrolysis is used in preparing samples for tryptophan analysis, tryptophan is racemized and *S. faecalis* R is, therefore, the organism of choice to determine the L-tryptophan content of the hydrolysate.

Another observation is that indole or anthranilic acid (ortho-aminobenzoic acid) can be utilized by *L. arabinosus* as a source of tryptophan only if sufficient vitamin B_6 (pyridoxine, pyridoxal, or pyridoxamine) is present in the medium (36). However, even though these results demonstrated that tryptophan can be synthesized by *L. arabinosus* from indole or anthranilic acid in the presence of vitamin B_6, other studies showed that *S. faecalis* R cannot utilize these tryptophan derivatives in the presence of vitamin B_6. These studies, therefore, have afforded information on the comparative utilization of tryptophan derivatives by different bacteria.

In other work it has been consistently demonstrated that certain amino acids can be synthesized if vitamin B_6 and biotin are present in adequate quantities in addition to carbon dioxide (34, 35, 56). Thus, *L. arabinosus* can readily synthesize aspartic acid when carbon dioxide and high levels of biotin are supplied. With low levels of biotin, aspartic acid is needed for growth, since insufficient synthesis of the amino acid occurs.

L. fermenti 36 has been shown to utilize both D- and L-methionine while other organisms, such as *S. faecalis* R, can effectively utilize only the L-isomer. This affords an opportunity to study by the use of both organisms the amount of racemization of methionine or the comparative utilization of the isomers by animals.

METABOLISM OF AMINO ACIDS

These and related investigations have facilitated the procurement of information on the metabolism of the amino acids by bacteria and animals. Thus, by studying the metabolism of the sulphur amino acids by *Neurospora crassa* mutants, it has been possible to demonstrate the steps in the synthesis of methionine and that the same intermediates are involved in the metabolic pathway between methionine and cystine as for animals (57).

The role of carbon dioxide as a building block for amino acid synthesis has been amply demonstrated. The enzymes involved in these systems have not been clearly defined. Whether they are catalyzing the reverse of the well established decarboxylation reactions has not been demonstrated; in fact, studies to determine this have indicated that the carboxylation of the appropriate amines is apparently not the step where carbon dioxide is incorporated into the amino acid molecule.

The use of chemically defined media, now that the purified amino acids are available and the requirements for the lactic acid bacteria investigated in some detail, affords an opportunity to study unknown growth factors for the test organism. By these techniques, it has been shown that *S. faecalis* R requires a factor for rapid growth which is present in liver. Similar findings have also been reported for other organisms.

With a better understanding of the nutritional requirements, metabolic pathways, and reactions involved in the life processes of bacteria, the biochemical processes involved in metabolism can be more adequately studied. It is believed that the studies with microorganisms will continue to afford valuable data on methods of analysis, amino acid composition of foods, amino acid utilization, and also on fundamental knowledge on amino acid metabolism.

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Problems of Medical Research

The scientists' love of learning has paid rich dividends in behalf of man's life extension. He has increased his life-span some thirty years during the last century. He has increased the mature and fruitful years and delayed senescent processes. He has uncovered startling facts concerning himself and his disorders. Man need not die today from pneumonia, nutritional deficiencies, and many ordinary infections that were previously so devasting.

Why do human tissues deteriorate prematurely? As a transformer of energy man begins to age when the gametes unite to form the zygote. The growth of the individual takes place through various phases and, according to the rhythm of natural law—maturation—the individual gains adult stature. After some time, wear and tear processes set in.

Evidence is available that premature degeneration of the vascular channels of the body resulting in apoplectic stroke, coronary occlusion, hypertension with hardening of the arteries, are caused by some disturbance in the intermediary fat metabolism of the body. Statistics indicate that some 600,000 lives are taken each year, the result of vascular damage. Many of these lives would be saved if more light were shed on the intermediary metabolism of food stuffs, notably the fats.

The human life span will be further increased when premature deterioration of tissues due to abnormalities in the intermediary metabolism of fats, proteins, and carbohydrates is more clearly understood. Vascular degeneration is one of the major challenges facing science today. Vascular emergencies, such as coronary occlusion and cerebral thrombosis, are increasing in number. It is estimated that some 4 million individuals have heart disease, and the number is increasing yearly. While the number of deaths from chronic valvular disease has steadily declined, the fatalities resulting from coronary artery disease are on the increase.

There is no essential relationship between the aging process and vascular degeneration. The latter is a pathological condition. As such, it is a deviation from the normal, and control measures will be available when a clearer understanding of the basic pathological physiology is brought about. Experimental work on lower animals indicates that certain substances, such as thyroid extract or iodine, may have an inhibiting effect in the development of fatty deposits just underneath the lining of the blood vessels, which represents the first deviation from the normal. When, to this deposition, hemorrhage is added, the blood vessel may be said to be started on its pathway to degeneration. The final deposition of calcium might be interpreted as a healing mechanism since calcium deposits elsewhere, as in the lung, are regarded as the end process of previous tissue destruction. The presence of calcium plugs the vessel wall and stays the hemorrhagic process.

Premature vascular degeneration occurs in association with high blood pressure, obesity, diabetes, myxoedema, progeria, and certain other clinical states. The geographical distribution and incidence of arteriosclerosis, with a study of dietary habits of population groups, is indicated. Experimental production in animals already has given much valuable information. Investigation of the part which the nervous system plays in the production of increase of blood pressure and its relationship to degeneration of blood vessels needs clarification.

The next fifty years should see the development of procedures which will minimize the premature deterioration of the human body.—*Taken from an address by Dr. Edward L. Bortz, former President, American Medical Association, before the American Pharmaceutical Manufacturers' Association in New York, December 16, 1947.*

Influence of Various Levels of Thiamine Intake on Physiologic Response[1]

I. Low-Thiamine Diets

KATE DAUM, W. W. TUTTLE, MARJORIE WILSON, HELEN RHODES, and MARGARET OSBORNE

Departments of Nutrition and Physiology, College of Medicine, State University of Iowa, Iowa City

With this paper, the JOURNAL *begins publication of a seven-part study on the physiologic response to various levels of thiamine intake. The succeeding parts of this series will cover the following subjects: II. Urinary Excretion of Thiamine; III. Reaction Time; IV. Vision and Hearing; V. Maximum Work Output; VI. Oxygen Consumption; and VII. Thiamine Requirements and Their Implications*

IN PLANNING a dietary regime for a long-term experiment using human subjects, certain inherent difficulties are encountered. The subjects are restricted not only as to kinds of food but also as to the place of eating and habits of between-meal snacks. The diet offered must, therefore, be attractive both as to content and variety. These factors are particularly important when thiamine is being studied, since anorexia is considered one of the early signs of deficiency.

Among the many studies on thiamine only one group, Anderson *et al.* (1), reported the details of the diet. They developed recipes which were attractive and different and which added variety to an otherwise monotonous regime.

In the experiments reported in the following papers of this series, diets were planned to provide: (a) levels of thiamine as low as total intakes of 100, 140, and 200 mcg. per day, (b) normal protein, and (c) caloric levels of 2200 to 2500. It was also planned to have cookies and candy available for evening snacks. The subjects lived as a unit in a nurses' residence of the State University of Iowa, and ate in the University Hospital dining room, either as a group or with other students or hospital personnel. These contacts proved an important factor in maintaining morale.

The difficulties encountered with diets providing 100 and 140 mcg. thiamine led to the development of many recipes and techniques of preparation. Thus it was possible later to provide a varied, attractive, and acceptable regime when the 200-mcg. thiamine diet was used for nineteen weeks. Rarely were refusals of food encountered.

The subjects were usually pleased with the meals, and the comments about the food in general were good. During the entire experiment, the subjects seldom rejected food. If food was returned, however, it was weighed and deducted from that subject's daily dietary calculation. The subjects always looked forward to special days and holidays for, even though they were on a diet, they knew those days would be marked with an unusual menu and perhaps a new food item.

Individual items, as well as recipes, were assayed for thiamine by the thiochrome (2) method before inclusion in the diet. A full day's diet was also assayed daily. The following techniques, recipes, and menus are offered as an aid to others who have the same problem.

FOODS INCLUDED IN EXPERIMENTAL DIETS

Cereals. Cake flour and unfortified Kix and Wheaties[2] were the cereals used. These were stored in a warm room (90°F.) for two to four months before use. Kix, in particular, proved valuable as it was the better liked of the breakfast cereals, was used as the filler in the meat loaf, and served as a substitute for Graham crackers in pie crust and puddings. Cake flour was used for all baked products except fritters, in which unfortified bread flour was used since otherwise they would not hold together when dropped into deep fat. Cinnamon rolls and shortcake were prepared by adding sugar to the sweet-cream biscuit recipe (see recipes at the end of this paper).

Cream and Butter. The cream was put through the separator twice in the University Hospital

[1] This work was supported by a research grant from General Mills, Inc., Minneapolis, Minnesota. Received for publication August 10, 1948.

[2] Especially prepared by General Mills, Inc., for this project.

TABLE 1

Sample menus from basal diet used during Experiment 2 which provided approximately 140 mcg. thiamine per day

BREAKFAST		NOON MEAL		EVENING MEAL		EVENING LUNCH		CALCULATED NUTRITIVE CONTENT		
Food	Amount	Food	Amount	Food	Amount	Food	Amount	Energy	Protein	Thiamine
Sunday										
	gm.		*gm.*		*gm.*		*gm.*	*calories/day*	*gm./day*	*mcg./day*
Applesauce	100	Pot roast	60	Broth, vegetable, clear	120	Candy Cookies	40 50	2554	60	143
Cheerios	15	Spaghetti, cooked	100	Crackers	10					
Bacon, crisp	15	Carrots, canned	100	Corn pudding	190					
Muffins	60	Peach, canned	30	Lettuce	10					
Butter	10	Lettuce	10	Cottage cheese, dry	20					
Cream	50	Butter	5	Butter	5					
Sugar	10	Butterscotch pudding	100	Prunes	50					
Coffee, as desired		Whipped cream	10	Cake, frosted	110					
Monday										
Prunes	75	Meat patties in cream	100	Chicken, creamed	125	Candy Cookies	20 50	2460	61	139
Kix	15	Rice, cooked	100	Salad, gelatin	100					
Bacon, crisp	15	Spinach, canned	100	Lettuce	10					
Biscuits	40	Pickles	20	Beans, wax	75					
Butter	10	Cottage cheese, dry	50	Butter	10					
Cream	50	Butter	5	Fruit cocktail, canned	100					
Sugar	10	Applesauce cake	95	Cookie	10					
Coffee, as desired										
Tuesday										
Peaches, dried	75	Meat loaf	100	Soup, vegetable, cream of	120	Candy Cookies	20 50	2520	58	140
Kix	15	Hominy	100	Crackers	10					
Bacon, crisp	15	Beans, wax	100	Cottage cheese, dry	100					
Biscuits	40	Butter	10	Lettuce	10					
Butter	10	Pear	50	Corn, white, canned	100					
Cream	50	Lettuce	10	Butter	5					
Sugar	10	Cheese, American	20	Cherries, white	100					
Coffee, as desired		Jello	120	Cake, frosted	100					
		Whipped cream	20							
Wednesday										
Prunes	100	Pot roast	60	Soup, vegetable	120	Candy Cookies	40 50	2491	58	141
Cheerios	15	Rice, cooked	100	Crackers	10					
Bacon, crisp	15	Carrots, canned	100	Sirup	20					
Muffins	60	Salad, gelatin	100	Corn fritters	75					
Butter	10	Lettuce	10	Beans, string	100					
Cream	50	Butter	5	Salmon, cold	60					
Sugar	10	Custard, baked	160	Butter	5					
Coffee, as desired				Peach	50					
				Lettuce	10					
				Apricot whip	150					
Thursday										
Applesauce	100	Chicken baked in cream	90	Soup, chicken	120	Candy Cookies	40 50	2387	61	127
Cheerios	15			Crackers	10					
Bacon, crisp	15	Rice, steamed	100	Beef, canned, sliced	60					
Biscuits	40	Beets, canned	100	Pickles	25					
Butter	10	Prunes	50	Pear	50					
Cream	50	Cottage cheese, dry	20	Lettuce	10					
Sugar	10	Lettuce	10	Butter	5					
Coffee, as desired		Butter	5	Pie, pumpkin chiffon	175					
		Jello	100							
		Whipped cream	20							

TABLE 1—*Concluded*

BREAKFAST		NOON MEAL		EVENING MEAL		EVENING LUNCH		CALCULATED NUTRITIVE CONTENT		
Food	Amount	Food	Amount	Food	Amount	Food	Amount	Energy	Protein	Thiamine
Friday										
	gm.		*gm.*		*gm.*		*gm.*	*calories/day*	*gm./day*	*mcg./day*
Apricots, dried	75	Fish, fried	90	Soup, vegetable	120	Candy	40	2325	60	130
Kix	15	Hominy	100	Cheese rarebit	100	Cookies	50			
Bacon, crisp	15	Spinach	100	Crackers	20					
Biscuits	40	Peach	50	Beans, string	100					
Butter	10	Lettuce	10	Butter	5					
Cream	50	Butter	10	Salad, gelatin, vegetable	100					
Sugar	10	Custard, baked	175	Cake, angel food	100					
Coffee, as desired				Lettuce	10					
Saturday										
Prunes	100	Meat patties	100	Chicken salad (canned chicken)	75	Candy	40	2593	62	134
Cheerios	15	Beans, string	75	Celery and pickles	20					
Bacon, crisp	15	Beets	100	Egg white, hard	25					
Biscuits	60	Salad, gelatin, fruit	100	Lettuce	10					
Butter	10	Lettuce	10	Corn, white	100					
Cream	50	Butter	5	Butter	5					
Sugar	10	Cake, angel food	110	Butterscotch pudding	140					
Coffee, as desired				Whipped cream	20					

pasteurizing plant and used after standing 24 hr. It was thinned with water for the breakfast cereals. The butter was melted, separated from the curd, and cooled.

Meats. The high-thiamine content of meats limited their inclusion to a few items, namely, crisp bacon, beef, fresh and canned chicken, fresh and canned fish, and canned Vienna sausages. All meats were cooked the maximum length of time without destroying palatability. This varied from 1 to 4 hr. Cream was used for the cooking medium as often as possible since this helped the flavor. Beef was prepared as pot roast, Swiss steak, meat loaf, and meat patties in cream. Baked, fricasseed, and creamed chicken and chicken salad were especially relished. Fried or baked fish and canned salmon, which was served either hot or cold, creamed, fried as salmon patties, or as salmon salad on crisp lettuce, were among the menu items.

Chicken broth formed the basis for most of the soups, which were varied by adding different seasonings, rice, or cream.

Cheese custard with noodles was made by substituting 140 gm. dry noodles for the 600 gm. cooked rice in the recipe for the cheese custard with rice.

The creamed entrées and cheese rarebits were served on steamed rice or crackers.

Vegetables. Since only a limited number of vegetables could be used, an endeavor was made to introduce new ones by destroying some of their natural thiamine content during cooking. Thiamine is stable in an acid medium, but unstable in a basic medium; therefore, soda was added early in the cooking process to some of the vegetables in order to raise the *p*H of the cooking liquor. It was found, for example, that the thiamine content of fresh cabbage could be lowered from 100 to 24 mcg. per 100 gm. (weight after cooking) by this method. The thiamine content was reduced in an approximate amount for frozen broccoli and cauliflower. This cooking procedure allowed the frequent inclusion of all three vegetables in the menu. (Approximately $\frac{1}{4}$ tsp. soda per 2 lb. vegetable, cooked in water, gave a *p*H of 7.5 to 8.0. When used in this amount, soda did not appreciably reduce the palatability of the cooked vegetable.)

Salads usually consisted of relishes, canned fruit, or some type of molded gelatin. Raw carrots and raw apples were added in the late winter when analysis showed a marked decrease in thiamine. Small servings of celery were added also.

Desserts. The most effective illusion of variety in the menus was accomplished by changes made in the desserts. Ingenious ways were used to "dress up" the same old sweets to look like something new and different. Several of the cake batters masqueraded as steamed puddings, snowballs, cup cakes, as well as loaf cakes; then, too, they were topped by a

TABLE 2

Sample menus from basal diet used during Experiment 3 which provided approximately 200 mcg. thiamine per day

BREAKFAST*		NOON MEAL		EVENING MEAL		CALCULATED NUTRITIVE CONTENT		
Food	Amount	Food	Amount	Food	Amount	Energy	Protein	Thiamine
				Sunday				
	gm.		*gm.*		*gm.*	*calories/day*	*gm./day*	*mcg./day*
Prunes, stewed	75	Chicken, fricassee	90	Soup, onion	120	2505	66	198
Kix	15	Rice, steamed	100	Crackers	10			
Bacon, crisp	15	Tomatoes, canned	100	Tuna fish }	60			
Muffins	60	Peach, canned	50	Egg white, hard }	50			
Butter	20	Lettuce	10	Celery } mixed	20			
Cream	90	Chocolate peppermint	120	Pickles, sweet }	10			
Sugar	10	pudding		Cream }	10			
Coffee, as desired				Mayonnaise }	10			
				Lettuce	10			
				Spinach, canned	100			
				Snowballs	80			
				Strawberries, frozen	30			
				Monday				
Peaches, dried	100	Beef, roast	80	Kool-Aid and lemon	180	2643	64	196
Cheerios	15	Corn, white, canned	100	Crackers	10			
Bacon, crisp	15	Asparagus, canned	100	Cheese custard with rice	165			
Biscuits	40	Salad, gelatin, fruit	125	Beans, green, canned	100			
Butter	25	Lettuce	10	Pear, canned	50			
Cream	90	Butterscotch pudding	120	Cottage cheese, dry	20			
Sugar	10	Whipped cream	20	Cream	10			
Coffee, as desired				Lettuce	10			
				Pie, deep dish cherry	120			
				Tuesday				
Prunes, stewed	75	Beef patty	100	Cocoa	180	2366	66	198
Kix	15	Cabbage, cooked (*pH*:	100	Crackers	10			
Bacon, crisp	15	8.0)		Beef, cold sliced	60			
Muffins	60	Beets, canned	100	Cheese, American	20			
Butter	20	Carrot sticks	20	Mustard, prepared	5			
Cream	90	Pickle, dill	20	Peach, canned	50			
Sugar	10	Lettuce	10	Celery	20			
Coffee, as desired		Peach betty	75	Tomatoes, canned	100			
		Whipped cream	20	Lettuce	10			
				Cake, angel food	100			
				Wednesday				
Peaches, dried	100	Swiss steak	60	Salmon, creamed	125	2344	62	200
stewed		Rice, steamed	100	Crackers	20			
Cheerios	15	Asparagus, canned	90	Celery, cooked	100			
Bacon, crisp	15	Apple, fresh	50	Cottage cheese, dry	20			
Biscuits	40	Lettuce	10	Pickle, sweet	20			
Butter	20	Floating island	110	Lettuce	10			
Cream	90			Pie, peach pan	125			
Sugar	10			Whipped cream	20			
Coffee, as desired								

*Butter and cream listed under breakfast were used during the three meals.

TABLE 2—*Concluded*

BREAKFAST*		NOON MEAL		EVENING MEAL		CALCULATED NUTRITIVE CONTENT		
Food	Amount	Food	Amount	Food	Amount	Energy	Protein	Thiamine
			Thursday					
	gm.		*gm.*		*gm.*	*calories/day*	*gm./day*	*mcg./day*
Applesauce	100	Chicken, baked	90	Lemonade	180	2581	61	199
Kix	15	Spinach, creamed	100	Crackers	10			
Bacon, crisp	15	Onions, cooked	80	Corn fritters	100			
Muffins	60	Salad, gelatin, fruit	125	Sirup	30			
Butter	20	Lettuce	10	Beans, green, canned	100			
Jelly	10	Ice cream, vanilla	100	Pears, canned	50			
Cream	90	Caramel sauce	50	Cheese, American	50			
Sugar	10			Lettuce	10			
Coffee, as desired				Fruit whip	150			
			Friday					
Peaches, dried, stewed	100	Salmon patties	100	Meat balls	100	2522	67	198
		Corn, white	100	Rice, cooked	100			
Cheerios	15	Beets, vinegar	100	Tomato juice	75			
Bacon, crisp	15	Apple, fresh	50	Asparagus, canned	100			
Rolls, cinnamon	45	Lettuce	10	Pickles, sweet	20			
Butter	20	Cake, angel food	100	Fruit cocktail, canned	100			
Cream	90	Fondant	50	Shortbread cookie	20			
Sugar	10							
Coffee, as desired								
			Saturday					
Apricots, canned	100	Beef, canned roast	75	Kool-Aid	180	2783	65	198
Kix	15	Gravy, brown	50	Cheese rarebit	100			
Bacon, crisp	15	Rice, steamed	100	Crackers	20			
Muffins	60	Cabbage, cooked (*p*H:	100	Beans, green, canned	100			
Butter	20	8.0)		Peach, canned	50			
Cream	90	Salad, gelatin, fruit	125	Cottage cheese, dry	30			
Sugar	10	Lettuce	10	Lettuce	10			
Coffee, as desired		Chocolate peppermint pudding	120	Snowballs	80			
				Lemon sauce	40			

*Butter and cream listed under breakfast were used during the three meals.

variety of icings, sauces, fruits, and whipped cream. Cooked icing (with a bit of coloring, flavoring, and maraschino cherries) was transformed into divinity. Colored fondant flavored with mint, taffy, and marshmallows were among the other special candies used.

Upon analysis, Clinton pudding mix was found to contain no thiamine, which allowed its use in many recipes. It was possible to make cocoa of good consistency with cream, water, pudding mix, a bit of sugar, and cocoa.

The fruit pies were made in such a manner that the sauce and crust could be weighed separately (see recipes).

Custard (cream thickened with egg white with yellow coloring added) was served both plain and with fruit. Cookies varied in shape, color, and flavoring and were spiced or plain, iced or sugared. Butterscotch, vanilla, and chocolate pudding found a place on the menu as cream pies or as puddings and were heaped with meringue or whipped cream. A layer of bananas found in the bottom of a dish of floating island greatly pleased the subjects. The epitome of all gustatory delights was the special ice cream (frozen custard) sundae, served with frozen strawberries, cherry, butterscotch, or chocolate sauce, and whipped cream.

NUTRITIVE VALUE OF EXPERIMENTAL DIETS

One consideration in planning the menus was to provide at least 60 gm. protein in each day's diet. Cheddar cheese, egg white, and dry cottage cheese were used frequently and added to many dishes to increase the amount of protein. A number of the desserts proved valuable in raising the protein intake as well as the caloric value.

The caloric value of the preliminary diet which furnished 100 mcg. thiamine averaged approximately 2200 calories per day. The 140- and 200-mcg. thiamine diets (Experiments 2 and 3 which will be described in detail later in this series [3]) carried 2500 calories. Each diet was adjusted to meet the actual caloric requirement of the subject by changing the quantity served of foods which were primarily energy-giving and contained little or no thiamine.

A week's menus at the 140-mcg. level of thiamine, together with each day's calculated totals for protein, calories, and thiamine, are presented in Table 1. In Table 2 are given the menus for the 200-mcg. level diet. Figures for calculations were taken from Bowes and Church (4) and other food tables (1, 5).

The determined thiamine content of 100-gm. portions of the special recipes is given in Table 3. The calculated thiamine content of 100-gm. portions corresponded closely to the assay values. Since thiamine determinations were made on the cream and flour used in the special recipes and these values were used in all calculations, this may account for the close correlation between the two values. However, all food items in which chocolate or cocoa were used contained approximately 5 mcg. per 100 gm. above the calculated thiamine value.

TABLE 3

Calculated and assayed thiamine values of foods used in low-thiamine diets

FOOD	THIAMINE	
	Analyzed	Calculated
	mcg./100 gm.	*mcg./100 gm.*
Beverages		
Cocoa	7.20	2.00
Kool-Aid	.2	1.38
Breads		
Biscuits	17.21	19.20
Muffins	17.45	17.90
Desserts		
Cakes		
Angel food	8.73	5.00
Applesauce	11.03	11.00
Apricot upside down	11.05	13.00
Chocolate cream	18.82	12.20
Peach upside down	10.55	14.00
Shortcake	20.08	16.80
Snowballs	10.15	15.00
White cream	11.97	9.00
Cookies		
Brown sugar	14.76	11.00
Scotch shortbread	13.71	11.00
Custards		
Baked	5.96	3.00
Pumpkin	8.25	9.90
Pies		
Apricot deep dish	10.75	20.58
Blueberry deep dish	11.71	19.33
Cherry deep dish	15.25	23.33
Chocolate cream	9.25	4.00
Peach pan dowdy	9.32	11.60
Pumpkin chiffon	11.55	7.00
Puddings		
Butterscotch	6.91	
Chocolate	7.26	
Chocolate peppermint	15.06	
Chocolate, steamed	15.57	
Floating island	11.80	
Miscellaneous		
Apple betty	7.88	10.00
Apple snow	7.31	7.00
Bavarian cream	5.02	3.40
Fruit whip	6.55	3.20
Lemon snow	3.16	1.30
Peach betty	7.50	10.00
Prune whip	13.96	9.20
Vanilla ice cream	7.43	3.10
Sauces		
Cherry	10.63	28.00
Chocolate	15.40	7.00
Lemon	6.93	3.80
Main dishes		
Brown gravy	6.23	5.20
Cheese custard with noodle	16.73	
Cheese custard and rice	11.92	11.10
Cheese rarebit	12.43	13.40
Cheese soufflé	14.81	14.40
Chicken, creamed	11.79	9.20
Corn fritters	14.17	28.30
Dried beef, creamed	13.50	33.20
Meat loaf	18.90	16.00
Meat patties in cream	18.04	16.00
Salmon patties	13.12	19.00
Salmon, creamed	13.71	14.10

A list of foods is included in which the calculated and assayed values of thiamine are compared.

Recipes are given for the preparation of the food items included in the low-thiamine diets.

SUMMARY

(a) Menus are given for three meals per day for one week. These menus provide a liberal caloric allowance with normal protein and do not contain more than 140 mcg. thiamine per day. Likewise, menus are given for a diet with a 200-mcg. level of thiamine. These menus are palatable and have been eaten with relish for long periods of time and without the development of psychologic reactions against them.

(b) A list of foods is included in which the calculated and assayed values of thiamine are compared.

(c) Recipes are given for the preparation of the food items included in the low-thiamine diets.

RECIPES

Vanilla Ice Cream

Approx. yield: 1200 gm. Portion: 100 gm.

Ingredients	*Amount*
Cream	120 gm.
Water	240 gm.
Sugar	240 gm.
Salt	⅓ tsp.
Egg white	175 gm.
Gelatin	12 gm.
Cold water	105 gm.
Yellow coloring	⅛ tsp.
Vanilla	1 tsp.
Cream, whipped	500 gm.

Directions:

1. Combine cream, water, sugar, salt, and slightly beaten egg whites.
2. Cook slowly over hot water until mixture coats a spoon.
3. Add gelatin softened in cold water and stir until dissolved.
4. Cool until it starts to congeal.
5. Add mixture, coloring, and vanilla to whipped cream.
6. Pour in refrigerator trays and freeze.

Cake Flour Sweet-Cream Biscuits*

Approx. yield: 700 gm. Portion: 40–50 gm.

Ingredients	*Amount*
Cake flour	375 gm.
Baking powder	2 Tbsp.
Salt	1¾ tsp.
Cream	475 gm.

Directions:

1. Sift dry ingredients.
2. Add cream and stir until flour is damp.
3. Turn on lightly floured cloth.
4. Knead 6 times.
5. Roll to ½-in. thickness and cut.
6. Bake in hot oven 12 to 15 min.

* Add 80 gm. sugar for shortcake.

Cheese Custard with Rice

Approx. yield: 2170 gm. Portion: 165 gm. raw mixture
155 gm. baked

Ingredients	*Amount*
Egg whites	280 gm.
Cream	700 gm.
Water	400 gm.
Salt	3½ tsp.
Mustard, dry	⅛ tsp.
Cheese, yellow, grated	420 gm.
Rice, cooked	600 gm.

Directions:

1. Beat eggs slightly and combine with other ingredients.
2. Place in individual baking dishes.
3. Set in hot water and bake in a slow oven until knife inserted comes out clean. This takes 1 hr. or longer.

Floating Island

Approx. yield: 1400 gm. custard
140 gm. topping
Portion: 100 gm. custard
20 gm. topping (before baking)
10 gm. topping (after baking)

Ingredients	*Amount*
CUSTARD	
Sugar	100 gm.
Cake flour	50 gm.
Salt	½ tsp.
Water	500 gm.
Cream	700 gm.
Egg whites	300 gm.
Vanilla	2½ tsp.
TOPPING	
Egg whites	300 gm.
Sugar	30 gm.
Vanilla	½ tsp.

Directions:

CUSTARD

1. Combine sugar, flour, and salt.
2. Add enough water to make a smooth paste.
3. Add remaining water, cream, and slightly beaten egg whites.
4. Cook over water until mixture coats a spoon.
5. Add vanilla and yellow coloring if desired.
6. Place in individual baking dishes.

TOPPING

1. Beat egg whites until stiff.
2. Add sugar and vanilla.
3. Place 20 gm. on each serving.
4. Bake in very slow oven.

Baked Custard

Approx. yield: 2240 gm. Portion: 175 gm. raw
160 gm. cooked

Ingredients	*Amount*
Egg whites	630 gm.
Cream	980 gm.
Water	700 gm.
Sugar	140 gm.
Salt	½ tsp.
Vanilla	4 tsp.
Yellow coloring	¼ tsp.

Directions:

1. Beat eggs slightly.
2. Combine with cream, water, sugar, salt, vanilla, and coloring.
3. Place in individual baking dishes.
4. Sprinkle with nutmeg.
5. Set in hot water and bake at a low temperature until knife inserted comes out clean.

Cake Flour Sweet-Cream Muffins

Approx. yield: 800 gm. Portion: 60 gm.

Ingredients	*Amount*
Cake flour	375 gm.
Baking powder	2 Tbsp.
Sugar	30 gm.
Salt	2 tsp.
Egg whites	150 gm.
Cream	450 gm.
Water	75 gm.

Directions:

1. Sift dry ingredients.
2. Beat egg whites slightly, add cream and water.
3. Add liquid ingredients all at one time to dry ingredients.
4. Stir until flour is damp, but not smooth.
5. Put in greased tins and bake in hot oven 15 to 20 min.

Cocoa

Approx. yield: 2600 gm. Portion: 180 gm.

Ingredients	*Amount*
Clinton chocolate pudding mix	228 gm.
Cocoa	10 gm.
Sugar	60 gm.
Salt	½ tsp.
Water	2000 gm.
Vanilla	1 tsp.
Cream	450 gm.

Directions:

1. Mix all dry ingredients.
2. Make a paste with small amount of cold water.
3. Add paste to remaining hot water and cream.
4. Cook over hot water and stir frequently.
5. Add vanilla.

Kixaroons

Approx. yield: 520 gm. Portion: 20 gm.

Ingredients	*Amount*
Egg whites	150 gm.
Sugar	370 gm.
Salt	1 tsp.
Vanilla	1½ tsp.
Kix	170 gm.

Directions:

1. Beat egg whites until stiff.
2. Fold in sugar, salt, vanilla, and Kix.
3. Drop from teaspoon on slightly greased cookie sheet.
4. Bake in very slow oven (300°F.).

Chocolate Pudding

Approx. yield: 1625 gm. Portion: 125 gm.

Ingredients	*Amount*
Clinton chocolate pudding mix	2 pkg.
Clinton vanilla pudding mix	1 pkg.
Cocoa	24 gm.
Sugar	140 gm.
Cream	300 gm.
Water	1000 gm.
Egg whites	360 gm.

Directions:

1. Mix dry ingredients.
2. Add cream to make a paste.
3. Add paste to hot water and cook until thickened.
4. Remove from fire and add hot mixture slowly to slightly beaten egg whites.

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Nutritive Value of Wild Greens

At the University of Minnesota, a study to determine the nutritive value of wild greens has been conducted by Jane M. Leichsenring and Loana M. Norris. The authors point out that many rural families use wild plants as food, and that many varieties are edible.

Wild greens are usually at their best early in the spring and may be found along roadsides, on waste land, in fields, and are even cultivated in gardens. The most commonly used green is that of the dandelion, but other early spring greens which are edible are the common plantain, marsh marigold, shepherd's purse, and curly dock. After the early varieties mature and are less palatable, midseason plants which can furnish greens appear—chickweed, lamb's quarters, strawberry blite, oxalis (sour grass), and wild lettuce. Toward the end of the season there are the common milkweed, sheep sorrel, amaranth, pigweed, and purslane.

Such greens may be served in a variety of ways. The youngest, most tender leaves may be used in salads, while others are best adapted to preparation as cooked greens. The mild-flavored ones may be steamed or cooked in a small amount of salted water; those with stronger flavors may require a larger quantity of water. The cooking water should be saved and used in soups, stews, and gravies, for it contains important minerals and vitamins.

The authors warn against the use of any greens except those which are known to be edible. This is particularly true of those in the wild carrot family, which have lacy leaves and small white or yellow flowers growing in umbrella-like heads, for they are poisonous. Water hemlock and poison hemlock also fall into the group of poisonous greens.

In this study fifteen species of plants from those recommended for human consumption were assayed for calcium, phosphorus, iron, and ascorbic acid. Specimens were gathered in fields, gardens, and along roadsides in the vicinity of the University of Minnesota Farm as soon as the young leaves and shoots were large enough to use.

It was found that several of the greens—notably alfalfa, milkweed, pigweed, plantain, and shepherd's purse—could contribute as much calcium as a cup of milk. Others—the dandelion, marsh marigold, strawberry blite, and wild lettuce—contained smaller, but still significant amounts. In curly dock, lamb's quarters, oxalis, purslane, and sheep sorrel, the calcium is thought to be unavailable because of the presence of oxalates.

In the assays for phosphorus the wild greens compared favorably with such garden vegetables as green beans, broccoli, Brussels sprouts, cabbage, carrots, potatoes, and turnips. They contained more phosphorus than cucumbers, lettuce, radishes, and tomatoes.

All of the greens analyzed contained significant amounts of iron. Four varieties—alfalfa, pigweed, shepherd's purse, and strawberry blite—contained more than 2 mg. per 100 gm., which makes them comparable in this nutrient to most varieties of fresh meat. One serving per day of most of these greens would supply more than one-tenth of the daily recommendation for iron for an adult.

It was found that most of the greens studied are good sources of ascorbic acid, and one—milkweed (124 mg. per 100 gm.)—was outstanding. Alfalfa, oxalis, and strawberry blite yielded comparatively large amounts of this vitamin. One serving of alfalfa, according to these assays, would provide one-third of the daily allowance for ascorbic acid for an adult man or woman.—*Abstracted from Minnesota Farm and Home Science 4: 4 (May 31), 1947.*

Physiologic Energy Values of Wheat[1]

ANNABEL L. MERRILL and BERNICE K. WATT

Bureau of Human Nutrition and Home Economics, U. S. Department of Agriculture, Washington, D. C.

FOOD shortages always bring new and added interest in nutritive values. During times of great stress, food-energy values of rations come under close scrutiny. Following World War II, with countries facing problems of rationing insufficient food supplies, attention was again focused on calories and the reliability of long used values. Methods developed over a period of years have led to differences in the expression of energy value with the result that the same food may be assigned a different number of calories by scientists in different countries. For example, in connection with quadripartite feeding of occupied Germany, more wheat was demanded in one zone than another to provide the same caloric rations because different caloric values were used. As a result of this situation, the Army requested the Bureau of Human Nutrition and Home Economics to review the scientific background and prepare such data as were necessary for dealing with the problem. Later, other agencies made similar requests. Numerous inquiries have been received regarding this work, and it is hoped that this article will serve to answer many of these questions.

Various methods in use for computing calories have been reviewed by Morey (1), Maynard (2), and more recently by an *ad hoc* committee of the Food and Agriculture Organization of the United Nations (3). A comparison of these methods, therefore, need not be repeated here; rather, attention will be given to an explanation of the Atwater procedure and its application to wheat flour.

THE PRINCIPLES OF THE ATWATER SYSTEM

Atwater, in developing caloric values for food, corrected the total (gross) energy or heat-of-combustion data obtained from bomb calorimeter experiments for undigested and unoxidized residues in the feces and urine (4). His procedure for doing this was to adjust the composition data, i.e., the ingested amounts of protein, fat, and carbohydrate, for losses in digestibility to get the quantity of each which was actually available to the body as a source of energy. Next, the remaining amounts of protein, fat, and carbohydrate were each multiplied by the appropriate heat-of-combustion figure and then totaled to obtain the physiologic fuel value of the food. In the case of protein, the figure for the heat of combustion was reduced by 1.25 calories per gram to allow for incomplete metabolism of the protein. This was done because investigations involving forty-six observations with human subjects had shown that for every gram of protein made available to the body, incompletely metabolized end-products equivalent to 1.25 calories per gram of protein were excreted through the kidney.

In developing the first part of his method of estimating caloric values of foods, Atwater drew on data from three kinds of investigations: (a) his compiled data on the proximate composition of American food materials; (b) information from more than a hundred experiments on human digestibility; and (c) American and European data on the heats of combustion of different kinds of food materials and compounds obtained from the experiments using the bomb calorimeter. The various steps in Atwater's plan of procedure are illustrated in the following paragraphs where his method is applied to data now available for wheat.

CALORIES OF WHEAT ESTIMATED ACCORDING TO ATWATER'S SYSTEM

Wheat is an important item in the food supply of many lands, and international groups have been seriously hampered by the discrepancies in caloric values resulting from the different procedures used in calculating its energy value. Attention has been turned first, therefore, to reviewing data available up to the present time that are useful in estimating the energy value of wheat flour of various degrees of extraction.

[1] The study of the subject of this paper was undertaken in cooperation with the Committee on Food Research of the Quartermaster Food and Container Institute for the Armed Forces. The opinions and conclusions contained in this report are those of the authors. They are not to be construed as necessarily reflecting the views or indorsement of the Department of the Army.

The flours of long extraction include a considerable portion of the outer layers of the wheat berry and have been shown to be less completely digestible than the more highly refined grades. A search of the literature was made, therefore, for studies giving digestibility data coupled with information on the extent of extraction of the flour and its composition in terms of protein, fat, and other constituents.

Considering the importance of wheat, relatively few studies were found, and in most of them the data regarding extraction were vague. There were seventy-two experiments on human digestibility using breads baked from whole wheat or nearly whole wheat flour, fifty similar experiments on flour of extractions considered to be from 85 to 93 per cent of the whole grain, and over one hundred investigations in which the bread used had been baked from patent flour. These studies on digestibility are summarized in Table 1.

The average composition data for the three groups of wheat flour studied are shown in the second column and apply to flour calculated on a moisture basis of 12 per cent. Protein was computed from nitrogen determinations by using the conversion factors of Jones (5), N × 5.83 for the whole wheat group, and N × 5.7 for the intermediate and patent flours. In a few studies reported in the literature, other factors had been used by the investigator but the data have been recalculated. The data on fat content shown in the second column were based for the most part on determinations of ether-soluble extract. The figures for the carbohydrate content represent the so-called "total carbohydrate by difference." They were obtained by subtracting from 100 the sum of the protein, fat, ash, and moisture. Included with carbohydrate that the body can use, therefore, are other materials—fiber, for example—which is very incompletely digested, and organic acids, some of which may be incompletely oxidized.

The average coefficients of digestibility of protein, fat, and carbohydrate in the studies reviewed are shown in the third column. For protein in the whole wheat group, the coefficient of digestibility was found to be 79 per cent and for the intermediate and patent flour groups, 83 and 89 per cent, respectively. For the small amount of fat present, the coefficient of digestibility of 90 per cent was used. This is the figure that was assumed by Atwater and most other investigators studying wheat. For carbohydrate, the average coefficients of digestibility for the three groups of flour beginning with the whole wheat were found to be 90, 94, and 98 per cent, respectively.

The data in the third column show that the wheat flours of long extraction have lower digestibility of

TABLE 1

Energy value of wheat flours of different levels of extraction determined from human digestibility studies and composition data

TYPE OF FLOUR	PERCENTAGE COMPOSITION*	COEFFICIENT OF DIGESTIBILITY	ENERGY VALUE OF AVAILABLE NUTRIENT**	AVAILABLE ENERGY†	FACTORS TO BE APPLIED TO INGESTED NUTRIENT
	gm./100 gm.	%	*calories/gm.*	*calories/100 gm.*	*calories/gm.*
Wheat—essentially whole, 97–100% extraction					
Protein (N x 5.83)	12.94	79	4.55	46.5	3.59
Fat	1.90	90	9.30	15.9	8.37
Carbohydrate	71.46	90	4.20	270.1	3.78
Total caloric value				332.5 (335)	
Wheat—intermediate (85–93%) extraction					
Protein (N x 5.7)	12.00	83	4.55	45.3	3.78
Fat	1.72	90	9.30	14.4	8.37
Carbohydrate	73.18	94	4.20	288.9	3.95
Total caloric value				348.6 (350)	
Wheat—patent flour, about 70–74% extraction					
Protein (N x 5.7)	11.57	89	4.55	46.9	4.05
Fat	1.18	90	9.30	9.9	8.37
Carbohydrate	74.75	98	4.20	307.7	4.12
Total caloric value				364.5 (365)	

* Average composition of the wheat flours used for the digestibility experiments was calculated to a 12 per cent moisture basis. Composition and digestibility data were based on 72 experiments in the case of the whole wheat and near whole wheat flours, 50 experiments on wheat of intermediate extraction, and over 100 experiments for patent flour.

** Figures are the same as those for heat of combustion except for the deduction of 1.25 calories per gram in the case of protein.

† Product of figures in second, third, and fourth columns.

protein and carbohydrate than refined flour. If the heats of combustion as determined in a bomb calorimeter were applied to the total assortments of proteins and carbohydrate, the caloric values would certainly be too high to represent the physiologic values. In the Atwater system, the coefficients of digestibility are applied to the composition data to make deductions for the loss of those portions of the ingested food which either are not absorbed or which, like the digestive secretions, have served their purpose and are subsequently eliminated through the intestinal tract. In either case they are lost to the body as a source of energy.

The energy values per gram of available nutrient used are shown in the fourth column of Table 1. In the case of fat and carbohydrate, these are the heats of combustion reported from experiments using the bomb calorimeter. For the fat of cereals, Atwater used a heat of combustion of 9.3 calories per gram. For carbohydrate, the heat of combustion for starch was assumed, and the factor 4.2 calories per gram was used. For protein, an energy value of 4.55 calories per gram was used. This also was based on heat-of-combustion data but takes into account certain corrections. Atwater assumed that 96 per cent of the weight of the estimated total protein was present as protein and 4 per cent as non-protein material. Gliadin, glutenin, and gluten of wheat were found to have heats of combustion of about 5.9 calories per gram; asparagin, which was used for estimating the heat of the non-protein fraction, was found to have a heat of combustion of 4.7 calories per gram. The result of weighting these two factors proportionately gives the figure 5.8 calories per gram of wheat protein. From this was deducted 1.25 calories per gram to allow for the incompletely metabolized end products of protein.

The product of the data in the second, third, and fourth columns has been entered in the fifth column. These figures are, therefore, the physiologically available energy from the protein, fat, and carbohydrate in 100 gm. of each type of flour, and their sum is the caloric value of the type of flour. In rounded figures, the energy value was found to be 335 calories per 100 gm. of whole wheat and near whole wheat, 350 calories for flour of about 85 to 93 per cent extraction, and 365 calories per 100 gm. of patent flour. The results of the experiments available for inclusion in this review have shown that when the differences in digestibility are taken into consideration along with data on composition and heats of combustion, flour of longer extraction appears to have a lower physiologic or available energy value to the body than the more refined product.

Wheat samples vary somewhat in their composition, and it is, therefore, desirable to develop factors that may be applied directly to the amounts of protein, fat, and carbohydrate in the particular wheat under consideration. Such factors, which for convenience are called specific factors (to differentiate them from the well-known 4, 9, 4) may be derived from the data in Table 1. They are the product obtained by multiplying the coefficients of digestibility as shown in the third column by the energy value per gram of available nutrient as shown in the fourth column.

The specific factors for the three groups of wheat flour are shown in the last column. For protein of whole wheat and near whole wheat, the caloric factors to apply to the amount of protein in 100 gm. of flour would be 3.59, the flour of intermediate extraction 3.78, and to patent flour 4.05. The caloric factors for carbohydrate for these same kinds of flour would be 3.78, 3.95, and 4.12, respectively. These may be contrasted with the factor 4.0 commonly used for both protein and carbohydrate.

Had the general factors 4, 9, 4 been applied to the composition data for these three flours according to the usual procedure in this country, the energy values would have been 355 calories instead of 335, 350, and 365 per 100 gm. for the three, respectively. The energy value of whole wheat flour would be overestimated and that of the patent flour would be underestimated but to a lesser degree.

DERIVATION OF THE GENERAL FACTORS 4, 9, 4

Atwater recognized the need for an expeditious plan of evaluating dietaries in terms of calories. Therefore, when he presented his method (4), he adapted it to calculations of the average mixed diets of people in this country.

As already pointed out, data on digestibility were limited. However, from experiments that had been conducted in which either a single food or a very simple mixed diet had been used, it was possible to prepare tentative coefficients of digestibility for the protein, fat, and carbohydrate in different kinds of foods.

Atwater then checked these tentative coefficients with data from ninety-three experiments on digestion in which the men ate diets that were considered entirely normal in amount, proportion, and preparation. The results of these experiments were com-

TABLE 2

Average coefficients of digestibility for nutrients in different food groups

FOOD GROUP	PROTEIN	FAT	CARBOHYDRATE
	%	%	%
Animal foods	97	95	98
Cereals	85	90	98
Legumes, dried	78	90	97
Sugars and starches			98
Vegetables	83	90	95
Fruits	85	90	90
Vegetable foods	84	90	97
Total food.....	92	95	97

pared with the calculated results in which the various tentative coefficients for each kind of food had been applied to the quantities of the respective foods in the diet. Some discrepancies between the observed and the computed data were found. Atwater adjusted the tentative coefficients slightly, making the changes he considered most probably correct. The resulting average coefficients of digestibility for the nutrients in different food groups and for total nutrients in a mixed diet are shown in Table 2.

In deriving these figures, Atwater drew on still another type of information. He had made a study of some 250 dietaries and considered the data from 185 of them to be suitable as a basis for estimating the average quantities of different kinds of foods used by persons of the industrial, commercial, and professional classes of that period. From these studies, he calculated both the relative proportion of the different kinds of foods used and the proportions of the total protein, fat, and carbohydrate in the diet that each kind of food supplied. For example, he found that meat, fish, and poultry comprised 20.1 per cent of the total food and supplied 43.0 per cent of the protein and 55.3 per cent of the fat. The total animal food, including eggs and dairy products as well as meat, fish, and poultry, made up 45.3 per cent of the diet and supplied 61.2 per cent of the protein, 91.6 per cent of the fat, and 5.4 per cent of the carbohydrate. Foods of plant origin, including cereals, legumes, sugar, vegetables, and fruits, made up 54.7 per cent of the total diet and supplied 38.8 per cent of the protein, 8.4 per cent of the fat, and 94.6 per cent of the carbohydrate.

Using the data available on composition, digestibility, and heat of combustion, and data derived from the relative proportions of foods used, Atwater found the fuel value of ingested protein from animal sources to be 4.27 and from vegetable sources 3.74[2] per gram. He obtained an average figure of 4 calories per gram for protein in the total diet by weighting these figures according to the proportion that protein of animal and vegetable products occurred in the diet. Fat from animal sources was found to have 8.93 and from vegetable sources 8.37 calories per gram. As animal sources provided by far the larger proportion of the total in the diet, Atwater considered the fuel value of fat in animal sources to represent fat in the diet as a whole and later rounded the figure to 9.0 calories per gram. In the case of carbohydrate, the fuel value per gram was found to be 3.82 calories from animal sources and 4.03 from vegetable foods. The weighted average was rounded to 4.0 calories per gram.

The question is raised as to the feasibility of the continued use of the general factors 4, 9, 4. They may be applied appropriately when estimating the energy value of average family diets or the national food supply of this country calculated on the basis of the total quantity of protein, fat, and carbohydrate. Under those circumstances these factors do not introduce any appreciable error. Even in the case of a mixed diet for a normal individual, the error that the general factors would introduce would probably be of little or no practical significance, because here the sources of food energy are relatively abundant.

For most other purposes, however, these general factors are not satisfactory. For example, they are inappropriate for experimental and therapeutic diets and for individual foods. And where food supplies are inadequate and grain forms a very large part of the diet, as is the case in large areas of the globe, a serious overestimation of the energy value of the ration may result from the use of the general factors.

[2] Data given in the original report (4) were 4.25 and 3.55 calories per gram for protein from animal and vegetable sources respectively, but some time after publication, it was discovered that a small error in procedure had been made in one of the last steps of the calculation and corrections were made on file copies. According to a note on one of these copies, the corrections were sent to Magnus Levy in a letter of July 6, 1904.

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Protein Intake from Cereals

According to a report of D. Breese Jones, Department of Agriculture, almost one-third of the total protein intake in the United States is furnished by cereal grains, chiefly, wheat, corn, oats, barley, and rice. Although cereals contain smaller quantities of protein than meat, poultry, and fish, they are eaten so regularly and in such quantity that the protein they provide adds up to an important amount. The proteins of oats, rice, and rye, Dr. Jones reports, are superior in growth-promoting or body-building value to those of corn, wheat, and barley.—*From Food and Home Notes, August 11, 1948.*

Ascorbic Acid Content of Foods as Served[1]

MARGARET L. FINCKE,[2] MARGARET A. McGREGOR,[3] CLARA A. STORVICK,[4] and ELLA WOODS[5]

School of Home Economics, Oregon State College, Corvallis; Washington Agricultural Experimental Station, Pullman; School of Home Economics, University of Washington, Seattle; and Idaho Agricultural Experiment Station, Moscow

SEVERAL years ago, the nutritional status of college students in respect to ascorbic acid was the subject of a cooperative study (1) made by the Home Economics Research Departments of the Pacific Northwest Experiment Stations. The results showed that approximately one-half of the women studied and three-fourths of the men had blood plasma ascorbic acid values below 0.8 mg. per 100 cc. In that study no attempt was made to determine whether these relatively low values were due to the type of foods served or to excessive losses in preparation.

At a meeting of the leaders of nutritional research in these institutions held in December, 1942, it was decided to undertake another cooperative study to investigate the amount of ascorbic acid available to students from the meals served in their dining halls. Accordingly, plans were made to analyze all foods served which contained fruits, vegetables, or other possible sources of ascorbic acid for a period of two weeks in as many dining halls on each campus as possible and to obtain, where practical, blood plasma ascorbic acid values from students who had been eating the food sampled.

The adjustments in eating arrangements made necessary by having units of the armed services at these colleges prevented the carrying out of the plans in their entirety. In some instances, the length of the period was not the full two weeks, and in only one case—that of a girls' group at Oregon State College—were blood plasma values available. However, it seems of value to report the results of these studies made during 1943–44 at Oregon State College, Washington State College, the University of Washington, and the University of Idaho.

EXPERIMENTAL PROCEDURE

The procedures used were essentially the same at all institutions. The usual portion for an individual serving was collected at the time the students were served. Each portion of food was placed in an individual container, protected from the light, taken directly to the laboratory, weighed, and a sample taken for analysis.

Except at the University of Washington, the method of Loeffler and Ponting (2) was followed for the determination of reduced ascorbic acid. Unless the foods were known to be especially rich in this factor, 50 gm. were blended in 200 to 350 cc. of the extracting acid solution. For such foods as citrus fruits and certain vegetables, smaller samples were used. At the University of Washington, analyses were made by the Bessey and King (3) modification of the dye titration method.

The extracting medium varied somewhat among the laboratories but was either a 1 per cent metaphosphoric acid solution or a 0.4 per cent oxalic acid solution. At the University of Idaho, a one-to-one by volume alcohol and water solution containing 1 per cent oxalic acid was used for the extraction of potatoes and other cooked starchy foods. This was suggested by Bolin (4) to facilitate filtering.

Food samples from the evening meals were extracted and the extracts stored in the refrigerator for photoelectric colorimeter readings the next day. At the University of Washington all the analyses were completed the day the samples were taken.

[1] Contribution of the Northwest Nutrition Research group. Received for publication July 13, 1948.

[2] With the assistance of Phyllis M. Carpenter and Edith Milling. Approved for publication as Technical Paper No. 548 by the Director of the Oregon Agricultural Experiment Station and the Dean of Home Economics, Corvallis.

[3] With the assistance of Ethelwyn B. Wilcox. Published as Scientific Paper No. 658 College of Agriculture and Agricultural Experiment Stations, Institute of Agricultural Sciences, State College of Washington.

[4] With the assistance of Lillian Ford and Eleanor Ferguson. Present address, School of Home Economics, Oregon State College.

[5] With the assistance of Patricia Keepings. Published with the approval of the Director of the Idaho Agricultural Experiment Station as Research Paper No. 246.

TABLE 1

Ascorbic acid content of food as served in some college dining halls of the Pacific Northwest

FOOD	OREGON STATE COLLEGE			UNIVERSITY OF WASHINGTON			WASHINGTON STATE COLLEGE			UNIVERSITY OF IDAHO			ASCORBIC ACID—MEAN OF ALL VALUES
	No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		
		Range	Mean		Range	Mean		Range	Mean		Range	Mean	
		mg./serving	*mg./serving*		*mg./serving*	*mg./serving*		*mg./serving*	*mg./serving*		*mg./serving*	*mg./serving*	*mg./serving*
Apple, raw	3	5.5– 7.6	6.2	0			0			9	0– 7.5	4.4	4.9
Apple, baked	0			1		0.8	0			1		0	0.4
Apple Betty	0			0			0			2	0.6– 1.5	1.1	1.1
Apple crisp	0			1		1.6	0			0			1.6
Apple rings	0			0			1		1.0	0			1.0
Applesauce	3	0– 1.6	0.6	1		2.2	0			11	0– 1.5	0.6	0.7
Apricots	0			0			1		7.0	3	5.5– 8.6	7.1	7.1
Asparagus	4	5.0– 5.8	5.5	2	3.5– 8.8	5.2	1		22.0	4	2.0–13.8	9.0	8.4
Beans, baked	0			1		2.1	0			0			2.1
Beans, green	6	0– 1.6	0.8	2	0.7– 2.2	1.5	1		0.9	18	0– 6.2	1.2	1.1
Beans, Lima	0			1		0.6	0			0			0.6
Beans, wax	0			1		2.9	0			0			2.9
Beef, roast	0			8	0.9– 5.6	2.2	0			0			2.2
Beef Jardinee	0			0			0			1		4.6	4.6
Beets	3	0– 3.6	2.3	0			0			8	0.3–12.5	5.8	4.9
Broccoli	1		2.0	1		30.1	0			1		51.5	27.9
Brussels sprouts	0			1		24.3	0			0			24.3
Cabbage, cooked	0			0			1		11.6	5	5.6–15.9	11.0	11.1
Cake, apple with orange sauce	0			0			0			1		2.1	2.1
Cake, pineapple upside down	0			2	3.3– 3.5	3.4	0			0			3.4
Cake, rhubarb upside down	0			0			0			1		1.1	1.1
Carrots, raw	5	0.5– 2.7	1.5	3	0.6– 3.2	1.7	2	0.4– 1.4	0.9	7	0.4– 5.7	3.1	2.1
Carrots, cooked	10	0– 2.6	1.2	3	2.0– 3.1	2.5	0			13	0– 4.3	1.7	1.6
Carrots and celery, cooked	1		2.2	0			0			0			2.2
Carrots and peas, cooked	2	0– 2.2	1.1	0			0			2	0– 0.7	0.4	0.7
Cauliflower	0			1		30.4	0			3	8.3–39.6	27.7	28.4
Celery, raw	3	0.2– 3.8	1.6	1		3.3	2	1.1– 1.3	1.2	16	0– 3.9	1.5	1.6
Cherries	1		2.1	2	2.5–17.1	9.8	0			3	0.2– 3.3	1.8	4.5
Chicken	0			2	2.1– 2.3	2.2	0			0			2.2
Chili	1		2.9	1		10.6	0			1		16.9	10.1
Cobbler, cherry	1		0	1		1.3	0			0			0.7
Cobbler, peach	0			0			1		2.0	0			2.0
Corn	2	2.0– 9.4	5.7	2	2.4–11.0	6.7	1		5.2	9	0.4– 6.9	3.2	4.2
Cream puff	0			1		0.4	0			0			0.4
Cucumber	1		1.3	0			0			0			1.3
Custard	0			1		1.2	0			0			1.2
Custard, banana	0			0			0			1		3.1	3.1
Egg, cooked	0			4	1.4– 2.7	2.0	1		0.7	1		2.1	1.8
Farina	0			0			1		1.0	0			1.0
Figs	0			2	0.8– 3.7	2.3	0			2		0	1.1
Fruit, mixed	2	8.4–13.9	11.2	0			0			2	4.3–10.2	7.3	9.2
Fruit juice, mixed	2	3.3– 3.6	3.5	0			0			3	0.2–13.9	5.4	4.6
Fruit sauce (for ice cream)	0			0			1		0.1	1		0.5	0.3
Goulash	0			0			0			1		7.4	7.4
Grapefruit	10	23.1–43.3	34.8	3	45.4–85.4	67.2	3	40.9–44.1	42.7	12	13.4–115.2	55.9	48.1
Grapefruit juice	0			0			0			20	22.7–66.1	45.2	45.2
Ham	0			1		1.4	0			0			1.4
Ham loaf	0			1		3.9	0			0			3.9
Hash	0			0			0			1		1.2	1:2
Jam, jelly, honey, and marmalade	3	0– 2.5	1.3	3	0.2– 0.6	0.3	6	0.1– 1.4	0.7	5	0– 3.7	1.8	1.0
Jello, fruit	3	0– 3.3	1.4	1		2.8	0			1		7.9	3.0
Ketchup	3	0.2– 0.8	0.5	1		4.7	0			8	2.7– 7.4	4.7	3.6
Lemon	0			0			1		2.4	1		6.2	4.3
Lemonade	2	7.5– 9.8	8.7	0			0			0			8.7
Liver	0			1		7.1	0			0			7.1
Liver sausage	0			1		1.2	0			0			1.2
Meat loaf	0			1		2.5	0			0			2.5
Meat pie	0			0			0			1		2.5	2.5
Meat sandwich	1		0.6	0			0			0			0.6
Milk	too small to measure			38	0.2– 5.1	1.1	7	2.4	2.4	0			1.6
Mustard	0			1		4.5	0			0			4.5
Noodles and meat	1		1.4	1		1.2	0			0			1.3
Olives	0			1		1.2	0			0			1.2
Onions, raw	0			0			0			3	0.9– 4.2	2.7	2.7

TABLE 1—*Continued*

FOOD	OREGON STATE COLLEGE			UNIVERSITY OF WASHINGTON			WASHINTON STATE COLLEGE			UNIVERSITY OF IDAHO			ASCORBIC ACID—MEAN OF ALL VALUES
	No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		
		Range	Mean		Range	Mean		Range	Mean		Range	Mean	
		mg./serving	*mg./serving*		*mg./serving*	*mg./serving*		*mg./serving*	*mg./serving*		*mg./serving*	*mg./serving*	*mg./serving*
Onion juice	0			0			1		0.3	0			0.3
Onions, boiled	2	1.1– 3.4	2.3	0			1		5.4	0			3.3
Onions, creamed	1		1.7	0			0			0			1.7
Onions, glazed	0			0			0			1		7.6	7.6
Orange	14	26.0–96.5	59.4	5	54.0–89.0	74.2	1		37.3	13	21.2–82.9	56.5	59.8
Parsnips	2	1.5– 3.1	2.3	1		5.5	1		6.1	3	0.5– 1.8	1.2	2.8
Peaches, canned or dried	5	0– 7.2	2.8	0			2	5.3– 5.8	5.6	11	0.6–12.2	3.3	3.4
Pears, canned	0			2	0.8	0.8	0			4	0– 1.6	0.4	0.5
Peas	3	2.0– 7.0	5.0	4	4.0– 9.5	5.6	0			15	0– 8.1	4.1	4.5
Peas and turnips	0			0			1		2.6	0			2.6
Pickles	0			2	1.1– 1.7	1.4	1		0.2	2	0– 0.3	0.2	0.7
Pie, apple	2	0– 0.5	0.3	1		1.0	0			1		0.1	0.4
Pie, banana cream	0			1		0.6	0			0			0.6
Pie, lemon	0			1		3.6	0			2	2.0– 4.2	3.1	3.3
Pie, peach	0			1		5.9	0			0			5.9
Pie, pumpkin	0			0			0			1		0	0
Pineapple juice	2	15.9–36.1	26.0	0			0			1		17.9	23.3
Plums, canned	0			0			2	2.3– 2.7	2.5	5	0– 1.8	0.8	1.3
Pork chop	0			1		2.1	0			0			2.1
Pork roast	0			1		1.1	0			0			1.1
Pork sausage	0			1		1.3	0			0			1.3
Potatoes, baked	3	4.5–10.4	8.1	1		9.2	0			10	3.7–19.0	11.4	10.5
Potatoes, boiled	18	1.3–15.8	6.7	6	0.6– 7.6	4.9	1		5.7	2	2.7– 8.5	5.6	6.1
Potato chips	0			0			1		7.6	1		0.3	4.0
Potatoes, creamed	0			0			1		6.8	2	0– 5.7	2.9	4.1
Potatoes, Franconia	1		1.4	0			0			3	4.3–13.8	7.6	6.5
Potatoes, fried	0			0			1		2.4	1		1.4	1.9
Potatoes, hashed brown	0			0			0			2	3.5–14.5	9.0	9.0
Potatoes, mashed	8	0– 1.7	0.3	5	0.9– 5.7	2.6	3	3.0– 3.6	3.4	33	0– 7.5	3.0	2.5
Potatoes, scalloped	1		2.3	0			0			3	4.8– 6.3	5.6	4.8
Potatoes, shoestring	0			0			0			1		4.0	4.0
Potato cake	1		2.8	1		1.3	0			0			2.1
Potato, other	0			0			0			4	0–13.6	7.3	7.3
Prunes	0			2	3.9–16.0	10.0	0			1		0	6.6
Prune whip	1		0.3	0			0			0			0.3
Pudding, orange cream	0			0			0			1		3.4	3.4
Radishes	5	2.5– 3.8	3.2	0			0			0			3.2
Relishes, raw	0			1		1.6	0			0			1.6
Rhubarb	3	0.5– 3.7	2.1	0			1		2.7	3	2.4– 4.9	3.4	2.7
Rice creole	1		0	0			0			0			0
Rice, Spanish	0			0			0			1		8.6	8.6
Salad, apple	1		5.8	0			1		0.9	5	0–19.0	5.3	4.7
Salad, apple and carrot	0			0			1		5.1	0			5.1
Salad, apple and orange	0			1		23.0	0			2	8.7–28.3	18.5	20.0
Salad, apple and raisin	1		1.7	0			0			0			1.7
Salad, apple and nut	0			0			0			1		2.0	2.0
Salad, apricot	1		2.7	0			0			1		0.6	1.7
Salad, banana	0			0			0			1		1.7	1.7
Salad, banana and pineapple	0			0			1		6.4	0			6.4
Salad, cabbage	4	10.1–46.2	20.5	2	25.8–26.4	26.1	1		52.3	5	20.0–29.9	25.7	26.3
Salad, cabbage and celery	0			1		9.8	0			0			9.8
Salad, cabbage and raisin	0			0			0			1		25.4	25.4
Salad, cabbage and tomato	1		19.3	0			0			0			19.3
Salad, carrot	0			0			0			5	0– 9.1	3.7	3.7
Salad, carrot and celery	0			0			0			2	1.9– 5.4	3.7	3.7
Salad, carrot and pineapple	0			0			0			1		1.1	1.1
Salad, carrot and radish	0			0			0			1		5.1	5.1
Salad, carrot and raisin	2	1.4– 1.5	1.5	2	4.3– 4.4	4.4	0			1		5.1	3.3
Salad, cottage cheese	1		0.5	0			1		1.7	0			1.1
Salad dressing, 1000 island	0			0			0			2	2.1– 5.8	4.0	4.0
Salad dressing, French	0			0			0			2	0.7– 0.8	0.8	0.8
Salad, fruit	5	3.0–11.4	7.4	4	10.5–24.1	15.4	0			5	0.2–16.8	6.4	9.3
Salad, fruit in gelatin	0			1		1.0	0			0			1.0
Salad, grapefruit	0			1		14.1	0			0			14.1
Salad, grapefruit and orange	0			0			0			2	19.1–34.1	26.6	26.6

TABLE 1—*Concluded*

FOOD	OREGON STATE COLLEGE			UNIVERSITY OF WASHINGTON			WASHINGTON STATE COLLEGE			UNIVERSITY OF IDAHO			ASCORBIC ACID—MEAN OF ALL VALUES
	No. of analyses	Ascorbic acid		No of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		No. of analyses	Ascorbic acid		
		Range	Mean		Range	Mean		Range	Mean		Range	Mean	
		mg./serving	*mg./serving*		*mg./serving*	*mg./serving*		*mg./serving*	*mg./serving*		*mg./serving*	*mg./serving*	*mg./serving*
Salad, lettuce	4	0– 6.8	3.2	2	0.5– 4.8	2.7	0			26	0– 3.5	1.2	1.6
Salad, macaroni	1		1.9	0			1		0.4	0			1.2
Salad, mixed	6	0– 5.4	2.2	0			0			1		0	1.9
Salad, orange	3	30.7–55.2	40.3	0			1		39.6	3	3.2– 6.2	4.8	25.0
Salad, peach	1		4.6	0			0			1		1.9	3.3
Salad, pear	0			2	3.4– 8.0	5.7	0			3	0– 0.4	0.1	2.4
Salad, green pepper	0			0			0			1		4.8	4.8
Salad, perfection	0			0			0			4	0– 7.9	2.9	2.9
Salad, potato	2	0– 2.5	1.3	0			0			6	0– 3.0	0.9	1.0
Salad, radish	0			0			0			1		1.0	1.0
Salad, tomato	5	1.1– 7.9	4.3	2	1.9– 6.2	4.1	0			1		2.2	4.0
Salad, tomato aspic	0			0			0			2	0– 0.8	0.4	0.4
Salad, tuna fish	0			0			0			2	0– 2.2	1.1	1.1
Salad, vegetable	0			2	7.3–18.5	12.9	1		18.0	3	3.1–18.4	8.6	11.6
Salad, Waldorf	2	1.8– 7.4	4.6	0			0			1		0.5	3.2
Sauerkraut	1		4.7	0			0			2	3.0– 4.2	3.6	4.0
Sherbert, pineapple	0			0			0			1		0.4	0.4
Soup	2	0– 6.3	3.2	0			0			0			3.2
Soup, bean and pea	0			1		12.2	0			0			12.2
Soup, corn chowder	0			0			0			1		6.2	6.2
Soup, cream of tomato	0			1		4.6	0			0			4.6
Soup, fish chowder	0			0			1		2.1	0			2.1
Soup, oyster stew	0			1		2.3	0			0			2.3
Soup, pea (split)	0			0			0			1		0.8	0.8
Soup, potato	0			1		1.8	0			0			1.8
Soup, tomato	0			0			0			1		5.0	5.0
Soup, vegetable	5	2.6–11.9	7.2	1		3.4	0			1		3.2	6.1
Soup, vegetable chowder	0			0			0			2	0–15.3	7.7	7.7
Shaghetti and tomato	0			2	1.5– 5.7	3.6	0			2	3.2– 4.6	3.9	3.8
Spinach	3	1.7– 4.6	3.0	2	7.0–20.0	13.5	0			5	2.1–20.0	11.5	9.4
Squash	0			4	2.4–14.4	6.1	0			0			6.1
Stew	3	2.0– 5.1	3.1	1		6.3	0			0			3.9
Strawberries	2	40.0–83.2	61.6	0			0			0			61.6
Stuffing	0			0			0			4	0– 5.0	2.0	2.0
Sweet potato	1		24.7	2	8.6–13.0	10.8	0			2	1.1–12.6	6.9	12.0
Tamale, tomato	0			1		11.6	0			0			11.6
Tartar sauce	0			0			0			1		0.8	0.8
Tomatoes, sliced	1		5.5	0			0			0			5.5
Tomato juice	7	9.5–30.0	19.8	0			0			9	13.2–42.2	27.3	24.0
Tomato sauce	0			0			1		3.1	2	0.7– 4.8	2.8	2.9
Tomatoes, stewed	3	20.3–29.0	25.0	1		11.8	1		11.0	6	16.4–20.4	18.3	18.9
Turnips	2	7.2–14.3	10.8	0			0			0			10.8
Veal	0			3	1.5– 5.7	4.1	0			0			4.1
Vegetables, mixed	0			0			1		5.7	1		0	2.9
Watercress	0			0			0			1		10.0	10.0

The collection of food samples and analyses were done on consecutive days at all places except Oregon State College where the food was sampled every other day.

Ascorbic acid in blood plasma was determined by the method of Farmer and Abt (5).

RESULTS AND DISCUSSION

In Table 1 data are presented showing the foods analyzed on each campus, the number of analyses made on each food, and the range and the mean value found for reduced ascorbic acid expressed in milligrams per serving.

Figures 1 and 2 show graphically the variation in the total reduced ascorbic acid supplied by the foods as served each day of the study.

In most of the dining halls milk was served at least twice a day. At Oregon State College milk was analyzed on several days but the amount of ascorbic acid each time was too small to measure. At the University of Idaho the milk was analyzed in early summer by the method of Roe and Kuether (6) which determines total ascorbic acid, including the dehydro form. The average value for this milk was 1.8 mg. per 100 cc., so that if as much as 500 cc. of such milk had been used, approximately 9 mg. of antiscorbutic substances would have been added to the day's supply. Milk is not included in the figures from Idaho.

Ten separate periods of study were made and in only three did the daily average for the period equal or exceed the Recommended Daily Allowances. An examination of the data presented in Figure 1 reveals that 75 mg., the daily amount of ascorbic acid

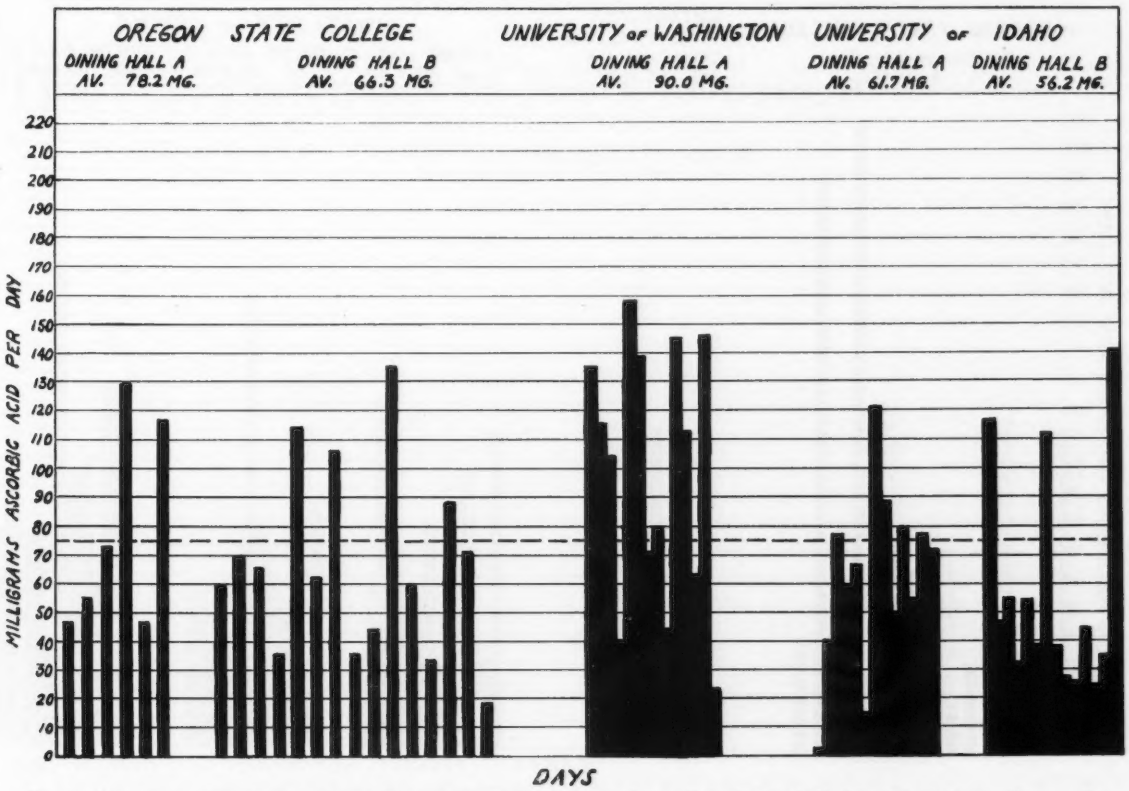

FIG 1. *Amount per day of reduced ascorbic acid in the food as served in college dining halls for men at three colleges. The dotted line indicates the Recommended Dietary Allowance for men.*

recommended for men by the Food and Nutrition Board of the National Research Council (7), was reached or exceeded on twenty-three of the sixty-two days when foods from the men's tables were analyzed. The daily allowance of 70 mg. recommended for women was met on twenty-five of the sixty-three days on which the women's food was studied (Fig. 2).

The amount of ascorbic acid offered in the food varied greatly from day to day as is shown graphically in Figures 1 and 2. This is true for all periods and for all dining halls. Even in the three in which food with the highest average values for ascorbic acid was served there was a wide day to day range.

Somewhat less variation in supply could have been accomplished by a slightly different selection of foods offered. The extremely high amounts were the result of serving citrus fruits one or more times on the same day that strawberries or vegetables, such as raw cabbage, broccoli, Brussels sprouts, or cauliflower, were served. On only two of the forty-eight days when the supply reached the recommended amounts was it done without the use of citrus fruit.

Undoubtedly the use of oranges and grapefruit simplifies the problem of providing ascorbic acid in sufficient amounts in the diet. Bessey and White (8) found that the amount of this nutrient in the vegetables and fruits available to city children was not enough to affect the blood plasma values unless citrus fruits or tomatoes were among the foods eaten daily. Analytical data from Table 1 show that the Recommended Daily Allowances can be provided by the generous use of certain vegetables and fruits other than citrus. This probably would mean the

TABLE 2

Ascorbic acid in blood plasma of women students eating in Dining Hall C, Oregon State College

SUBJECT	ASCORBIC ACID		
	1st test	2nd test	Av. 2 tests
	mg./100 cc. blood	*mg./100 cc. blood*	*mg./100 cc. blood*
MS	0.71	0.74	0.72
RH	0.62	0.73	0.68
KS	0.22	0.40	0.31
MBW	0.89	0.91	0.90
JC	0.80	0.88	0.84
NC	0.73	0.75	0.74
FE	0.43	0.41	0.42
HR	0.68	0.80	0.74
JH	0.71	0.75	0.73

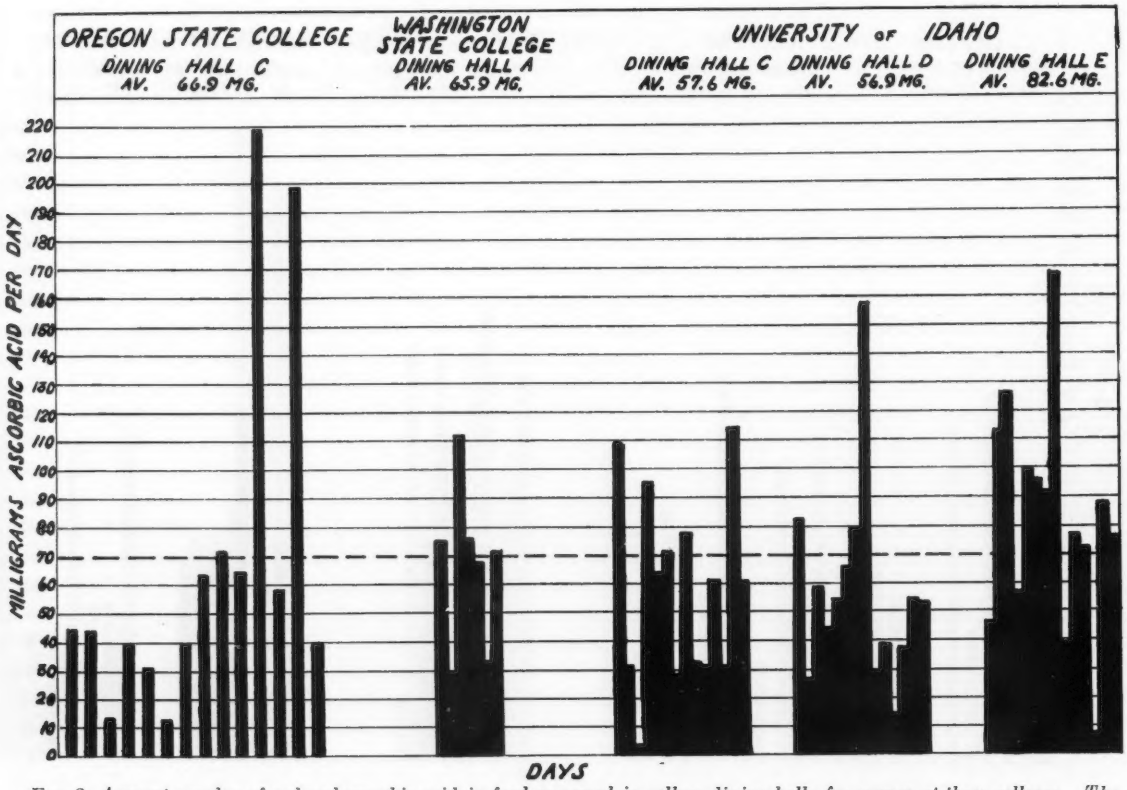

FIG. 2. *Amount per day of reduced ascorbic acid in food as served in college dining halls for women at three colleges. The dotted line indicates the Recommended Dietary Allowance for ascorbic acid for moderately active women.*

cultivation of tastes for some new foods. The generous use of raw vegetables and fruits will aid in supplying the needed ascorbic acid.

Table 2 gives the individual ascorbic acid blood plasma values of nine women eating in Dining Hall C at Oregon State College. These values ranged from 0.31 mg. to 0.90 mg. per 100 cc. with five of the nine subjects having levels of approximately 0.7 mg. These women were in the group where the food supplied an average of 66.9 mg. and, while the numbers were too few from which to draw a definite conclusion, they do suggest that for some individuals an average intake of more than 67 mg. is necessary if the blood plasma ascorbic acid concentration is to be maintained at about 0.8 mg. per 100 cc.

SUMMARY AND CONCLUSIONS

The analyses for reduced ascorbic acid in food as served to students in four colleges of the Pacific Northwest in ten periods varying in length from six to fifteen days each have been reported.

The data show that there was a great variation from day to day in all dining halls in the amount of reduced ascorbic acid provided by the foods offered. In only three of the ten periods studied did the average meet the recommended daily allowance.

The foods making the largest contribution per serving were citrus fruits, fresh strawberries, tomatoes, raw cabbage, broccoli, cauliflower, Brussels sprouts, and spinach.

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The Fundamentals of Job Evaluation

GEORGE N. SAUM

Vice-President, George Fry & Associates, Consulting Management Engineers, Chicago

INEQUITIES in pay are one of the most common sources of employee dissatisfaction and discontent, and, although compensation is by no means the sole factor in providing harmonious labor relations, it is a very important one. Employers too frequently overlook the fact that workers want their pay checks to fulfill three basic requirements:

(a) Pay which they feel is fair in relation to the pay of others on the same or similar jobs.

(b) Pay which is considered fair in relation to the pay of others on either more or less responsible and difficult jobs.

(c) Pay which compares favorably to the general level of pay in the community.

A sound plan of compensation should fulfill all these requirements. To do this, however, it is necessary to determine what each job in an organization is worth. The best known means of accomplishing this is by job evaluation.

Job evaluation is in no sense a mysterious or particularly complicated procedure. It is merely a systematic and objective means for rating and grouping jobs in the order of their relative difficulty, responsibility, and importance.

Job evaluations are made every day informally. Every employer is constantly faced with the necessity of determining how much the office boy should be paid in relation to the stenographer, and how much the stenographer should receive as compared to the bookkeeper. In most cases these decisions on the relative worth of jobs are accurate within reasonable limits. Even though they are accurate, however, they are not defensible because they are based primarily on arbitrary judgment, arrived at by random, rule-of-thumb methods.

Formal job evaluation is based on the premise that there are certain factors common to all jobs in varying degrees, and that the extent to which these factors are present in each job can be measured. For example, it is generally recognized that it takes a certain amount of experience to perform any job satisfactorily. The experience required may vary from 10 min. of instruction to weeks, months, and even years. Whatever the amount of experience required, however, it is measurable within reasonable limits. Another of the factors found in almost all job evaluation plans pertains to educational requirements. Some jobs require merely the ability to read and write, others require a good measure of education, and still others necessitate a highly technical educational background in the form of post-graduate degrees.

Most job evaluation plans provide definition of these, and other factors, which make it possible to measure the extent to which each factor, or element, is present in each job under consideration. In most plans a system of point values is used as the means of expressing the extent to which each factor is a requirement of each job. This can be explained more clearly by using an example.

One plan widely used for evaluating clerical, technical, and supervisory[1] jobs consists of seven factors, each of which is allotted a maximum point value as shown below:

FACTOR	MAXIMUM POINT VALUE
Experience	100
Education	75
Initiative and ingenuity	80
Attention and concentration	60
Responsibility	60
Supervision of others	90
Working conditions	35

Space does not permit reproduction of the definitions of each of these factors, but one of them—initiative and ingenuity—is defined below and serves to demonstrate the application of such descriptions in evaluating jobs.

Initiative and Ingenuity

This factor pertains to the independent action and exercise of judgment required in performance of the job.

1st degree	POINTS
Requires the ability to understand and follow instructions in the performance of routine tasks	1 to 18

[1] Labor, trades, and operating jobs are evaluated on a somewhat different set of factors.

2nd degree
Requires the ability to make occasional minor decisions but involves tasks which are primarily routine and covered by simple and adequate instructions..... 19 to 34

3rd degree
Requires ability to make frequent minor decisions or occasional decisions of some importance. Resourcefulness is a recognized characteristic of the job..... 35 to 50

4th degree
Requires independent decisions regarding adherence to policy, sequence of work, or similar matters are daily requirements of the job..... 51 to 66

5th degree
Requires outstanding ability to work independently toward general results, devise new methods, or meet new conditions necessitating a high degree of ingenuity, initiative, and judgment..... 67 to 80

It should be apparent from what has been said thus far that the fundamental premises of job evaluation are that (a) certain factors are common to all jobs in varying degree, (b) the presence of these factors in each job can be measured in point values, and (c) when all the jobs under consideration have been evaluated, a relationship expressed in point values is established between them. These relationships can then be converted to a sound salary or wage scale which will reflect equitable differentials in pay for all jobs from the lowest rated to the highest rated. This procedure and the other steps ordinarily required to make and install a job evaluation program are treated briefly in the following sections of this article.

Job evaluation procedure cannot be standardized. It varies with the individual application and depends upon a number of considerations. There are, however, seven general steps that usually must be covered in a job evaluation program:

DETERMINATION OF BASIC POLICIES

Before a job evaluation program is started, certain questions of policy should be decided: who will direct the program; who will be on the evaluation committee; and what action is to be taken with respect to wages or salaries of employees that turn out to be above or below evaluated rates.

The selection of the person who is to head up the program is of fundamental importance. To assure successful operation, the program should be under the general supervision of a major executive.

Who will do the rating is also important. As a general rule, the ratings should be made by a small committee, whose members are qualified by experience and by knowledge of the jobs to be rated. The genuine support of top management and the active participation of other levels of management are essential to the success of the program.

ANNOUNCEMENT OF THE PROGRAM

The program should be explained to employees to allay any possible uneasiness or suspicion—the extent of the explanation varying with circumstances. Employees should understand the reasons for the program and the general procedures and policies to be followed. Any mystery surrounding a job evaluation program is likely to breed apprehension and thus defeat the major objective of the program.

Under most circumstances it is best to announce the program by means of a letter, or through group meetings, or both. The letter should be carefully prepared to present a clear statement of the plan and the management policies with respect to the program.

The full effectiveness of a job evaluation program can be realized only if the members of the general supervisory group are completely informed as to the purpose of the program, how it is to be conducted, and their part in the project. Acceptance and understanding of the program on the part of supervision assures their cooperation and support. Any deficiency in this respect tends to lessen employee confidence in the job evaluation.

PREPARATION OF JOB DESCRIPTIONS

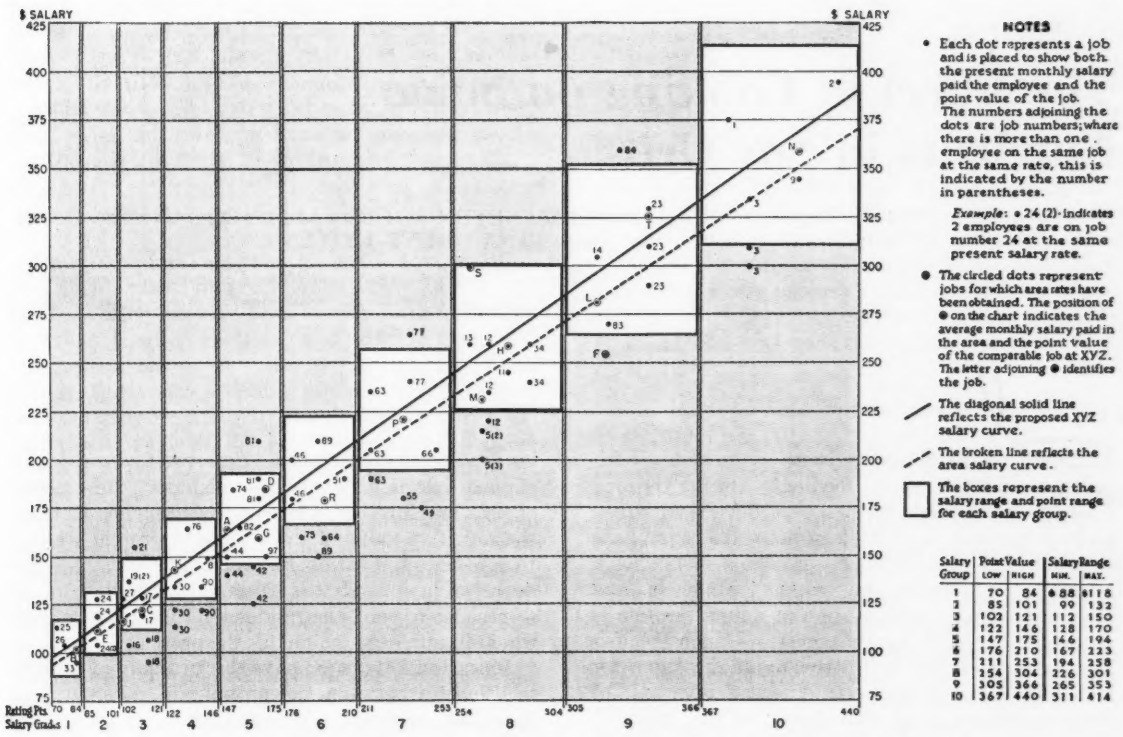
After the basic policies have been determined and the plan announced to the employees, the next step is the preparation of job descriptions, based on information obtained from the supervisor, or by interviewing the employee, or through employee questionnaires. These descriptions should include an adequate statement of the various duties performed and preliminary analysis and definition of the extent to which each factor is a requirement of the job.

EVALUATION OF JOBS

When all job descriptions are completed, the jobs are evaluated by the rating committee. In this rating, complete objectivity should be the goal, and the committee should disregard qualifications of incumbents and focus attention on the appraisal of job requirements reflected in the described job content.

DETERMINATION OF BASIC COMPENSATION RATES

The point ratings established by the rating committee are then converted into wage and salary rates. The precise procedure by which this conversion is effected varies with different situations. The objectives in making the conversion are: (a) to determine what the revised general pay scale should be; (b) what specific action needs to be taken with respect to the pay range of all jobs included in the program; and (c) consequently, what action needs


$ SALARY
$ SALARY
NOTES
• Each dot represents a job and is placed to show both the present monthly salary paid the employee and the point value of the job. The numbers adjoining the dots are job numbers; where there is more than one employee on the same job at the same rate, this is indicated by the number in parentheses.
Example: • 24 (2) - indicates 2 employees are on job number 24 at the same present salary rate.
● The circled dots represent jobs for which area rates have been obtained. The position of ● on the chart indicates the average monthly salary paid in the area and the point value of the comparable job at XYZ. The letter adjoining ● identifies the job.
The diagonal solid line reflects the proposed XYZ salary curve.
The broken line reflects the area salary curve.
The boxes represent the salary range and point range for each salary group.
Rating Pts.
Salary Grade
1
2
3
4
5
6
7
8
9
10

Salary Group	Point Value LOW	Point Value HIGH	Salary Range MIN.	Salary Range MAX.
1	70	84	$ 88	$118
2	85	101	99	132
3	102	121	112	150
4	122	146	128	170
5	147	175	146	194
6	176	210	167	223
7	211	253	194	258
8	254	304	226	301
9	305	366	265	353
10	367	440	311	414

CHART 1. *Correlation of salary rates and salary grades for clerical, sales, and supervisory employees.*

to be taken with respect to individuals on these jobs. Ordinarily the result of such analyses can be presented effectively and graphically by a correlation chart, such as the example shown. This chart is for the most part self-explanatory and represents an actual job evaluation.

MAKING ADJUSTMENTS IN SALARIES OR WAGES

Invariably it is found that some employees are being paid at a rate either below or above the range recommended for their jobs. It is generally sound policy to raise the rate of those employees who are receiving less than the newly established rate to at least the minimum of the new rate range, or to the single rate, established for their jobs.

The other group, those who are already receiving more than is provided in the recommended wage-salary structure, present a more difficult problem. They may be employees with a long tenure, who, through a variety of circumstances, are overpaid. To the extent possible, this condition should be adjusted by promotion or transfer to higher rated jobs. As a general rule, the compensation of such employees should not be reduced. Time would ultimately cure those situations where promotion or transfer is not the answer—but a program of corrective action will speed the adjustment.

MAINTENANCE OF THE PROGRAM

A job evaluation program cannot be established and then be forgotten. It must be kept up to date if it is to be effective. Jobs in which duties are revised and jobs that are newly created must be analyzed and rated. Requests for the re-evaluation of jobs must be considered. Hiring rates, transfers, promotions, and salary adjustments must be kept within the established scale. Job descriptions must be audited with sufficient frequency to make certain that job content and job description are in agreement. Records must be maintained accurately.

Effective maintenance of the plan depends upon the establishment of appropriate procedures and controls to provide the necessary information and follow-up. The particular procedures and controls that are essential will vary with the installation, but the points enumerated above must be covered.

It should not be assumed that job evaluation should constitute either the sole basis or the last step in establishing an effective program of employee relations. On the contrary, it is the starting point and provides the foundation—a basic rate structure which is fair to employer and employee, because it is graduated according to job difficulty and job responsibility and is in line with area rates.

The Effect of Cooking on Some Nutrients in Soy Grits[1]

ELIZABETH CROFTS CALLISON, JANET E. BEAR, and ELSA ORENT-KEILES[2]

Bureau of Human Nutrition and Home Economics, Agricultural Research Administration, U. S. Department of Agriculture, Beltsville, Maryland

IN THE past, soybean oil meal has been utilized chiefly in animal feeding. During the war emergency, however, recipes were developed which make it possible to utilize soy flour, flakes, or grits in many different types of palatable dishes as a means of improving the protein intake of any population whose consumption of animal protein is curtailed. Several compilations of such recipes have been published (1–6) which give directions for including soya products in a great diversity of dishes, such as yeast and quick breads, biscuits, griddle cakes, waffles, pastries, cakes, cookies, cooked cereals, meats, stews, soups, gravies, sandwich spreads, and candies. The conditions, temperatures, and times of cooking vary with the type of recipe. For example, there is *no* cooking of sandwich spreads and some types of confectionery, whereas there are brief periods of heating the soya in liquid when added to soups or stews, short exposure to high temperatures in the presence of little or no moisture in pastry, longer cooking at high temperatures in moist dough in breads of various kinds, and cooking over boiling water for varying lengths of time when combined with cereals.

The role of moist heat in converting the protein of raw soybeans from a form which has low nutritive value to one which approaches that of the proteins of animal origin, has been appreciated for many years. All modern processing methods for debittering, removing the oil from the bean, and converting the meal to flour, flakes, or grits for human consumption include exposure to some degree of heat. It is generally assumed that the amount of heat employed is sufficient to completely develop the nutritive value of the abundant protein present. In a recent publication, Sherman (7) states that "the degree of heating that is helpful in extraction of oil serves also to cook the residue sufficiently to develop the full nutritive value of the proteins."

Jones and Divine (8) have shown a supplementary relationship between the proteins of patent wheat flour and soy flour. Carlson, Hafner, and Hayward (9) have recently published results of experiments demonstrating the improvement of white bread by the inclusion of small amounts of soy flour and have made comparisons with the results of others.

While measuring the biologic efficiency of the protein of a number of soya products being used in the development of recipes in the foods laboratory of the Bureau of Human Nutrition and Home Economics, it was found that rats receiving fifteen parts soy flakes combined with eighty-five parts oatmeal which had been cooked in a double boiler as a breakfast cereal, grew considerably more than a similar group of animals fed the same mixture uncooked. In view of this finding and of the great variety of methods used in preparing different soya dishes, a systematic study of the effect of some common cooking procedures upon the nutritive value of four samples of processed soya products was undertaken. Measurements were also made of thiamine, riboflavin, niacin, calcium, phosphorus, iron, and moisture.

EXPERIMENTAL PROCEDURE

For the purpose of reducing the number of experimental variables, finely ground soy grits[3] were

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[2] The authors wish to thank Helen Diering Strock for the thiamine determinations, and Gerda Siegel and Jeanette Schaevitz for the riboflavin and niacin measurements. In addition, we are greatly indebted to Mary E. Kirkpatrick, Food Specialist, for invaluable suggestions and advice in the cooking procedures used.

[3] These samples of soy grits were supplied by several manufacturers in 1943 as representative of regular production at that time. All had been subjected to a certain amount of heat in processing with the idea of producing a product having good flavor and aroma.

used in all of the culinary preparations studied, even though it is recognized that soy flour is normally used in preparing biscuits, pie crust, and griddle cakes and that flakes are more suitable for cereal combinations. This substitution is justifiable, however, since the three products are identical except for the size and shape of the particles.

Cooking Procedures

Four different samples of grits—two expeller- and two extraction-processed[4]—were studied uncooked, after cooking in a double boiler for four different lengths of time, and after mixing and baking as pie crust, biscuits, or griddle cakes. In all, thirty-two different samples were analyzed and compared. Since it was desired to study the nutritional value of soy grits alone, uncomplicated by other factors, ingredients which contributed either protein, vitamins, or minerals to the finished product, though necessarily used in the preparation of palatable products for human consumption, were omitted from the preparations intended for analysis. For example, no cereal was added when soy grits were cooked by double boiler; no wheat flour was used in the griddle cakes, biscuits, or pie crust; distilled water was used as the moistening agent, and eggs, baking powder, and salt were omitted entirely. The form of the product and cooking procedures employed were those described by the Bureau of Human Nutrition and Home Economics (1).

Cooking in the double boiler was standardized as exactly as possible. The same utensils, burner, and height of flame were used for all samples. One liter of distilled water was brought to the boiling point in the inside pan of a double boiler, 300 gm. of soy grits were added, and the mixture brought back to boiling over the open flame. The pan was then covered, placed in the outside pan containing boiling water, and the cooking continued without stirring for 15, 30, 60, or 120 min. The cooked food was cooled as rapidly as possible by placing the pan in cold running tap water. It was then spread in thin layers on trays of a commercial dehydrator and dried at 70°C. with forced draught to a moisture content of approximately 2.5 per cent. The dried food was ground and stored in closed jars at 4.5°C. until used. The maximum storage period for any sample was two months.

Moisture

Water content was measured by drying representative aliquots of the foods to constant weight at 80°C. in a vacuum oven.

[4] In the expeller method, the oil is expressed from soybeans by pressure in processing; in the extraction process, it is removed by a chemical solvent.

Thiamine

Thiamine was measured by the thiochrome method. To provide for adequate sampling, 100 gm. of the product were first blended with 5 N sulphuric acid and aliquots representing 15 to 20 gm. of the soy grits were taken. Extraction, digestion, and oxidation were performed essentially according to the method of Conner and Straub (10), but with the substitution of polidase for clarase, which is the enzyme recommended. Fluorescence was measured with the Pfaltz and Bauer fluorophotometer against a quinine sulphate standard (11). A duplicate analysis of pure thiamine hydrochloride was performed each day as a check upon the method.

Niacin and Riboflavin

Microbiologic assays were used in the determination of niacin and riboflavin. Several 100-gm. portions of the sample were mixed in a Waring Blendor with 0.15 N sulphuric acid, and aliquots were taken from each blend for determinations of each vitamin. The method of Snell and Wright (12) with a medium modified by the addition of para-aminobenzoic acid as suggested by Isbell (13), was employed for niacin. Snell and Strong's (14) microbiologic method was employed for riboflavin; for both determinations bacterial activity was measured by titrating the acid formed during incubation. Standard curves using pure niacin and riboflavin, respectively, from which the vitamin contents of the unknown were read, were prepared with each series of determinations. Because of the extreme photosensitivity of riboflavin, care was taken to perform all operations with this vitamin in low actinic glassware and to exclude direct light from the room as much as possible.

Calcium

After samples of the products were dried in a vacuum oven and incinerated in a muffle furnace at 500° to 600°C., the resulting ash was treated with hydrochloric acid, filtered, and the precipitate washed thoroughly with hot water. The filtrate was then made up to a volume of 100 to 250 ml., depending upon the size of the sample taken, and calcium was determined on aliquots by the macro calcium oxalate-permanganate titration method of the Association of Official Agricultural Chemists (15).

Phosphorus and Iron

Separate samples of the product were weighed, treated with magnesium nitrate, and ashed as above. Phosphorus was then determined by the macro molybdate method of the Association of Official Agricultural Chemists (15), and iron by the ortho-phenanthroline method of Cowling and Benne (16).

Biologic Efficiency of the Protein

Male rats twenty-one to twenty-eight days of age, weighing 40 to 50 gm., were distributed in groups of six, the average initial weights of the several groups being equalized as nearly as possible. For a period of six weeks these animals, housed in individual cages with wide mesh screen floors, received distilled water and the experimental diet *ad libitum*. The diet consisted of Osborne and Mendel salt mixture 4 per cent, cod-liver oil 2 per cent, cottonseed oil 8 per cent, yeast concentrate[5] 2 per cent, a sufficient amount of the food under investigation to supply protein at a 10 per cent level, and cornstarch to complete 100 per cent. The factor N × 6.25 was used for converting Kjeldahl nitrogen to protein. This factor is customarily employed for making the conversion in the case of soya protein. If the factor 5.9, which appears to be more nearly correct (17) is used in making the conversion, the level of protein fed was 9.4 instead of 10 per cent. Cottonseed oil was omitted from the diet which contained pie crust because of the high-fat content of the crust itself.

The average of three consecutive daily weighings at the beginning and end of the six-week experimental period were used as the initial and final weights of the animals, respectively. In addition, weekly weighings of the animals and thrice weekly measurements of food consumption were made. The data were analyzed statistically by the covariance analysis method of Snedecor (18). The lot weight gains were adjusted to a common protein intake with the regression coefficient and protein efficiencies calculated from these adjusted weight gains.

For purposes of comparison, the protein efficiency of roller dried skim milk was measured concurrently; in all, ten groups of comparable animals were used in this study. The protein content of the milk was calculated by means of the factor N × 6.38.

[5] Harris yeast concentrate. This preparation contributed 0.9 per cent protein to the experimental diet.

TABLE 1

Moisture, nitrogen, vitamin, and mineral content of four samples of uncooked soy grits

SOY GRITS SAMPLE*	WATER	NITROGEN	THIAMINE	RIBOFLAVIN	NIACIN	CALCIUM	PHOSPHORUS	IRON
	gm.	*gm.*	*mcg.*	*mcg.*	*mg.*	*mg.*	*mg.*	*mg.*
A—expeller type	5.76	7.9	369	405	2.43	239	622	8.39
B—expeller type	7.06	8.0	1021	336	2.73	238	648	8.36
C—extraction type	8.78	8.1	681	301	3.30	248	636	10.22
D—extraction type	10.62	7.9	1444	423	2.99	258	652	10.00

* All values are reported in terms of 100 gm. of the product A.P.

RESULTS AND DISCUSSION

The nitrogen, moisture, mineral, and vitamin content of the four samples of soy grits are summarized in Table 1. The samples differed little in nitrogen content; they were also very similar in calcium, phosphorus, and riboflavin content. The

TABLE 2

Protein efficiency and thiamine retention of four samples of soy grits as affected by seven cooking procedures

COOKING PROCEDURE AND SAMPLE	PROTEIN EFFICIENCY*	THIAMINE RETENTION**
		%
Uncooked		
A—Expeller	1.73	
B—Expeller	1.61	
C—Extraction	1.90	
D—Extraction	1.76	
Cooked over boiling water 15 min.		
A—Expeller	2.57	98
B—Expeller	2.32	70
C—Extraction	2.86	75
D—Extraction	2.07	83
Cooked over boiling water 30 min.		
A—Expeller	2.46	90
B—Expeller	2.08	51
C—Extraction	2.79	61
D—Extraction	2.01	55
Cooked over boiling water 60 min.		
A—Expeller	2.08	76
B—Expeller	2.09	54
C—Extraction	2.71	55
D—Extraction	2.16	25
Cooked over boiling water 120 min.		
A—Expeller	2.14	94
B—Expeller	2.34	56
C—Extraction	2.10	61
D—Extraction	2.21	47
Biscuits		
A—Expeller	2.41	80
B—Expeller	2.24	65
C—Extraction	2.32	32
D—Extraction	2.00	48
Griddle cakes		
A—Expeller	1.67	56
B—Expeller	2.17	56
C—Extraction	2.00	59
D—Extraction	1.87	43
Pie crust		
A—Expeller	1.63	59
B—Expeller	2.27	20
C—Extraction	1.91	23
D—Extraction	1.78	24

* Protein efficiency is calculated as the average gram gain in body weight per gram of protein eaten.

** Thiamine retentions compared on the dry weight basis.

grits processed by the extraction method averaged 22 per cent higher in niacin than did the expeller products. One expeller and one extraction product were exceptionally rich in thiamine, while the other two contained one-half to two-thirds as much of this vitamin. These large differences in thiamine value appear to be unassociated with the method of processing and may reflect a difference in thiamine content of the original beans used.

Table 2 summarizes the effect of the different cooking procedures upon the two heat-labile nutrients of the soy grits studied, i.e., protein and thiamine.

Figure 1 presents the protein efficiency of the variously treated grits in comparison with that of the skim milk, the average value of 2.86 for the ten assays being used as the standard of comparison.

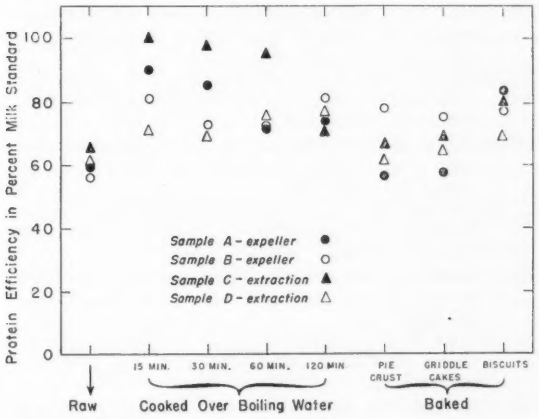

FIG. 1. *Comparison of protein efficiency of variously treated soy grits with that of skim milk.*

Cooking over boiling water for 15 and 30 min. produced increases in the biologic efficiency of the protein of all four samples which proved to be highly significant statistically. The protein of Sample *C*, for example, when heated 15 min. became equal to that of the milk in promoting weight gains. The protein efficiency of Samples *B* and *D* was not changed further by cooking times of 60 and 120 min. Samples *A* and *C*, however, showed a marked fall in protein efficiency when heated for the two longer periods of time. Parsons (19) has noted similar effects in the protein value of the whole soybean following cooking with moist heat, boiling, and autoclaving, i.e., improvement followed by deterioration of protein quality. Of the three baking procedures used, baking for a moderate length of time in the presence of moisture, as in biscuits, resulted in the most consistent and significant increases in protein efficiency, whereas baking as pie crust, where heating time is shorter and there is very little moisture, resulted in the least improvement of protein quality.

Barnes *et al.* (20) have compared several methods of measuring quantitatively the growth-promoting quality of protein, using four products representing a wide range of biological efficiencies. They concluded from their experiments that to obtain valid results, each protein should be fed at the level which gives maximum gains per gram of protein consumed. For proteins having an efficiency of 2.0 or more, a level of 10 per cent was close to optimal. *Ad libitum*, as compared with paired feeding, gave better absolute values for all but the poorest protein (wheat gluten) studied. Hegsted and Worcester (21) have recently published an evaluation of the method of measuring protein efficiency by calculating gram gains in body weight per gram of protein eaten. They emphasize the necessity for recognizing values for protein efficiency derived in this way as "only relative." They also state that "in the strict sense, [these values] should only be used to compare the groups of animals studied at one time."

There are, to our knowledge, no published collaborative studies of the method of measuring protein efficiency to serve as a basis for judging the reproducibility to be expected of such assays either in different laboratories or at different times in the same laboratory. An analysis of experimental data, such as has been made for the vitamin A bioassay by Irwin (22), might demonstrate that there is no greater variability in the bioassay of protein efficiency than in the same type of measurement of vitamin activity.

In considering the thiamine retentions during the several periods of cooking over boiling water, it is of interest that there was a progressive reduction of retention during the 15- and 30-min. cooking periods and then either an increase in retention or no further change following the 60- and 120-min. periods of heating. It appears logical that this increase in thiamine retention with prolonged heating was apparent rather than real and may have been due to the formation of fluorescent substances in the heated material. Such inexplicable increases in thiamine as measured by the thiochrome method have been observed in this laboratory (23) following processing of other foods, notably mushrooms and spinach. That there may be some connection with changes in the protein structure and consequent production of fluorescent substances is suggested by the fact that the long periods of heating employed in these experiments also have a tendency to change the protein, as evidenced by a lowering of its nutritional quality. The production of fluorescent material by deterioration of protein has been described by Pearce and his co-workers (24–26).

SUMMARY

Studies were conducted to determine the effect of heating, as in cooking and baking, upon the nutri-

tional quality of four samples of commercially processed soy grits, two processed by the expeller method and two by the extraction method. Growth tests with rats were used to test protein efficiency; thiamine was measured by the thiochrome method; and riboflavin and niacin were determined by microbiologic procedures. The grits were also analyzed for calcium, phosphorus, and iron content.

The experiments demonstrated that neither the expeller nor extraction process employed in the manufacture of the soy grit samples studied fully developed the nutritive value of their protein.

Heating at boiling temperature for 15 and 30 min. in the presence of moisture increased the biologic efficiency of the soya products' protein to a considerable degree. Further heating for periods of 60 and 120 min. resulted either in no further change in the protein quality or a significant decrease in this value. However, products cooked for the two longest periods were better in protein efficiency than the uncooked grits.

Baking, as in biscuits, resulted in greater increases in protein efficiency than did baking for shorter times and/or with less moisture as for either griddle cakes or pie crust.

These experimental results suggest that in preparing recipes in which one of the soya products is included, the soya should be added whenever possible at a time when cooking is to continue for 15 to 30 min. longer, rather than at the end of the cooking period, as is often recommended.

Cooking for periods up to 60 min. resulted in losses of thiamine up to 50 per cent; further cooking brought about either no further change or apparent increases in retention which may be due to the formation of fluorescent substances during protein alteration. Riboflavin and niacin values were unaffected.

It is suggested that a comprehensive statistical study of the reproducibility of protein efficiency bioassays might give a basis for valid comparison of values obtained in different laboratories and at different times.

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Editorial

HELEN E. WALSH, PRESIDENT OF THE AMERICAN DIETETIC ASSOCIATION

Helen E. Walsh, gifted with intelligence and charm, brings to the office of President of the American Dietetic Association, a breadth of experience which gives her an appreciation of the varied interests of its members. Rarely has the Association been so fortunate in its choice of a leader.

Members of the Association are bound together by their interest in nutrition and the practical application of this science for the benefit of mankind. This common link is a strong bond, but the actual work of the individual members covers a wide range of activities connected with this broad principle. Roughly, the field is divided into four spheres of applied nutrition as outlined by the four sections of the Association: Food Administration, Community Nutrition, Professional Education, and Diet Therapy. Usually the President's experience lies in one of these fields; her particular interest in the Association is slanted by her own professional work.

Miss Walsh is almost unique in that her career includes hospital dietetics, teaching, and public health nutrition. This background gives her an insight into the possibilities of service of the Association to the individual members and an understanding of the many contributions which the Association can make to the community.

Her work has brought her to many parts of the United States. She has lived in the East, the South, the Middle West, and the Far West. Her natural tolerance and understanding of people has been broadened and deepened by this comprehensive experience.

Helen E. Walsh was born in Des Moines, Iowa, of Irish descent, and she probably owes much of her wit and charm to her handsome father and attractive mother. After completion of St. John's grade school, she attended and graduated from St. Joseph's Academy in Des Moines. Helen took her home economics work at Iowa State College, Ames, where she received a Bachelor of Science degree in 1928.

While Helen was in college her father retired and, like many other Iowans, moved his family to California. Shortly thereafter, Helen became a student dietitian at the Cottage Hospital, Santa Barbara, California. Because of her keen interest in people and a desire to work directly with them, she accepted a position as nutritionist with the Los Angeles County Health Department and the Los Angeles County Tuberculosis and Health Association. Her exceptional ability in dealing with people and in aiding them with their economic and nutritional problems soon resulted in her rapid advancement in the organization. In 1935 she was made Supervisor of Nutrition of Los Angeles County for the California Relief Administration. She remained in this position for four years.

Helen was never one to slip into a complacent and comfortable rut. Although her work and her alert mental attitude kept her abreast of the developments in the field of nutrition, she was not satisfied. In the fall of 1934 she took a three-month post-graduate course at Scripps Metabolic Clinic in La Jolla, California. During another summer vacation she went to the University of Chicago and took several courses in food economics. In 1939 she resigned from her position to enter Columbia University, New York City, when she received her master's degree in 1940.

From 1940 to 1942 she was Assistant Professor of Home Economics at Oregon State college, in Corvallis. With the war clouding the horizons of the world, Miss Walsh wished to take an active part in national defense, and she accepted an appointment as Liaison Officer representing the Nutrition Division in the Middle West district. She acted as field consultant to state and county Nutrition Committees in Illinois, Wisconsin, and Indiana.

Her administrative talent and her personal aptitude for dealing with individuals of varying backgrounds and viewpoints were quickly recognized. In this large national organization Helen's natural tact and sincere friendliness were valuable assets. Such attributes make a natural leader. The warmth of her personality smoothed many situations during the planning of the nutrition programs, which, to be a success, must attract all types of people in every community. Her unaffected liking for people made all this easily possible. The success of her program in the middle western states led to her promotion to a larger responsibility. She was transferred to direct the work for the nine western states and Hawaii. In this position she acted in an advisory capacity working with existing agencies which were furthering the cause of good nutrition in these states.

HELEN E. WALSH
President, The American Dietetic Association

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In 1945 Miss Walsh accepted a reserve commission with the rank of Lieutenant Commander in the U. S. Public Health Service. She was assigned to the newly-created Nutrition Section of States Relations Division as Nutrition Consultant. In this position she took part in the studies of the nutritional status of population groups. Although the studies and observations were made in various parts of the country, Miss Walsh's headquarters and office were in Washington, D. C.

Desiring to be closer to her family in California, Miss Walsh accepted a position as Supervising Nutritionist for the California State Department of Public Health in San Francisco, on September 1, 1947.

During all these busy professional years Helen Walsh has always found time to be active in the American Dietetic Association. In spite of her heavy responsibilities, she has been called upon again and again to serve the Association, and she has responded generously to all of these requests. In the California Dietetic Association, she was successively Chairman of Community Education, Secretary, and Treasurer. In 1939, the year the American Dietetic Association held its annual meeting in Los Angeles, Helen was President of the California Dietetic Association. Her gracious manner contributed greatly to the hospitality of that outstanding national convention.

In 1935 the American Dietetic Association met in Boston and Helen Walsh was elected Vice-President. Those who saw her there will remember the lovely young girl in a golden brown dinner dress which reflected the bronze lights in her auburn hair. This was her first national office. Her youth and beauty, strengthened by the confident poise due to this early recognition of professional ability, inspired many a young dietitian to hope to be like her. It seems historically appropriate that it should be in Boston that she was inducted as President.

In the crowded war years when Helen's schedule, like many others, was running 14 hours a day, she accepted the appointment of Chairman of Community Nutrition for the Association. She served six years in this position and did much to develop the broad program of this section.

Helen Walsh is also a member of the American Public Health Association and the American Home Economics Association. With her as President, the American Dietetic Association can be assured of a year of wide accomplishment encompassing the interests of all members.—*Katherine Mitchell Johnson, Juneau, Alaska.*

What Are FAO's Functions?

Producing enough food to feed human beings as they should be fed and getting that food distributed where it is needed are about the most important jobs the world faces today. How does the Food and Agriculture Organization of the United Nations help in those jobs?

FAO does not itself buy or sell or give away food or the means of production, such as tools and fertilizers. Nor does it directly carry on agricultural development anywhere. Nor does it give financial aid to countries for agricultural development. We are an international consulting agency on nutrition, agriculture, forestry, and fisheries. We furnish information, advice, and technical assistance on a wide range of problems, from production through marketing, transport, storage, and consumption. Our clients are our fifty-seven member nations. From us, they get help in determining what ought to be done and the best ways of doing it. Then they themselves, separately or in groups, carry on the necessary operations. This is vital and essential work, even though we are not an operating agency. This work of FAO falls into four main lines of activity.

First, we foster the development of the underdeveloped and so-called backward areas where production must be modernized and greatly increased if their people are ever to have enough food.

Second, we foster improvements in the distribution of the products of farms, forests, and fisheries to bring this distribution in line with modern needs. A modernized distribution system must assure prices that are fair to consumers yet high enough so that producers in the technically advanced countries can go on supplying the world's needs for food without fear of a terrible economic beating such as they took in the inter-war period. Such a modernized system would also make possible the building up on a world scale of adequate reserves of basic foods.

Third, FAO gets the representatives of its member nations together periodically to consider the food and agricultural position throughout the world and to plan advantageous adjustments and developments. This incidentally involves maintaining a constant flow of up-to-date statistical and other information, which it is FAO's business to gather and circulate.

Fourth, we work closely with other United Nations agencies concerned with finance, trade, and economic development. Obviously, FAO's field is not a water-tight compartment. It is part, perhaps the most important part, of a much bigger world economic organism. All the parts must function together if there is to be progress.—*From an address by Norris E. Dodd, Director-General, Food and Agriculture Organization of the United Nations before the Mount Holyoke College Institute on the United Nations, July 9, 1948.*

Current Comment

THE DIETITIAN AND HER COMMUNITY[1]

ADELIA M. BEEUWKES

Assistant Professor, Public Health Nutrition, School of Public Health, University of Michigan, Ann Arbor

What are some of the factors that have tended to isolate the dietitian from community living? Until rather recent years dietitians were usually expected to "live in." Their personal household problems were the worry of the institutional administration. Now, more dietitians are living as members of a community—hunting apartments, battling traffic jams, and buying food, carefully reading the community newspaper for current best buys and market prices for food they will buy for their own use. In other words, the dietitian has been forced into a wider world. Her environment, her acquaintances, her professional expansion, and her shorter working hours have all tended to push her out of the protected confines of institutional living into the complex community of which she is a member.

Why, then, is it possible for some dietitians to feel secure and at home in a community while their colleagues feel they must move on and on, never finding a community that satisfies their high hopes? Is the answer to be found in the community or in us? People make the community, not the reverse! Each of us chooses the *extent* to which we will become a real part of the community. A bank doesn't offer interest unless you first make a deposit. Community living doesn't offer companionship and the opportunity to share our interests and our problems unless we make a contribution. There is *no limit* to our choice of interests, hobbies, and activities; the limiting factor is within ourselves! As members of a community we *may* limit our community life to what we offer professionally, or we may become artists in living as well as technicians in a scientific field. *Techne* is the Greek work for art; techniques, however, can degenerate into thoughtless routine.

As dietitians, our training has been vast but largely in a specific field. In most instances it has not been as broad as we might have wished. This very specialized training plus the parental protection that is inevitably a part of institutional life have been two important factors tending to isolate us from community living.

Next, let us consider some of the ways in which this isolation has been evidenced. In our teaching of patients our isolation has been evidenced in the *very language* that we use. Consider what the term a "final ulcer diet" may imply to the patient. Does it mean that this is the diet to end all diets? Is this a diet for the final and last stages of a disease? Does the term imply hope or despair? Probably all dietitians have been asked whether a "Sippy diet" means that the diet is to be sipped. Are such words as "broil," "sear," and "simmer," really understood by all of the patients we teach? Perhaps it is difficult for us to appreciate the limitations of another's understanding of our professional jargon. To emphasize my point, would the majority of patients understand what a nurse meant if she glibly used terms such as "gavage," "lavage," "irrigate," and "wet dressings"? I am reminded of the public health nurse who went into a home to find that a recently discharged hospital patient was attempting to follow the intern's orders for hot wet dressings placed on a leg wound. A hot, wet, "bread" dressing was well spread over the wound. To that patient a hot dressing brought to mind only the stuffing for a turkey. This misunderstanding is no more startling than the boiling of orange juice by a mother for her two-month-old baby. But, you say, "Then why did the patient say that he understood my instructions?" The answer is in the realm of human weakness. No one likes to admit that he doesn't understand; no one wants to advertise the fact that he is ignorant. Furthermore, many patients are overawed into speechlessness by the physical surroundings in which dietitians work.

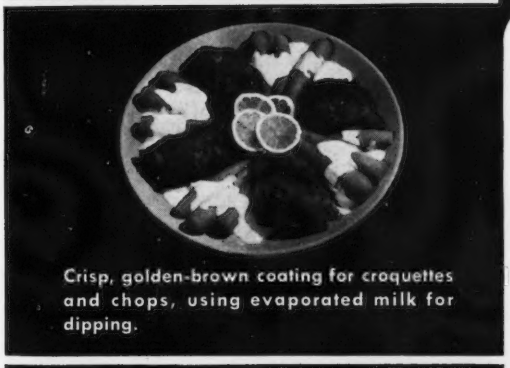
Our misunderstanding of community needs is also evidenced in our telling the patient why he is being placed on a particular diet. It rarely occurs to *ask the patient to explain* to us why the doctor has made this recommendation.

This lack of understanding is further evidenced by offering dietary instructions that cannot possibly be carried out by the patient for economic, cultural,

[1] Presented at the meeting of the Illinois, Wisconsin, Indiana, Michigan Dietetic Associations, Tri-State Hospital Conference, in Chicago on May 4, 1948.

Juicy, easy-to-slice meat loaf using evaporated milk as a binding agent.

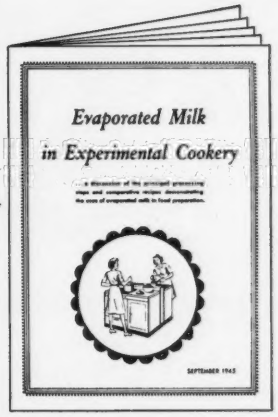
Tangy, eggless mayonnaise using evaporated milk as the emulsifying agent.



Crisp, golden-brown coating for croquettes and chops, using evaporated milk for dipping.

Delicious, smooth-textured desserts made with whipped evaporated milk.

Foods that are *High in Food Value* Yet low in cost



Real money-saving ideas you can use every day are contained in "Evaporated Milk in Experimental Cookery." In addition, this useful booklet shows you how to include unusually large amounts of whole milk in dishes that meet recognized standards.

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or religious reasons. Community living will help us to appreciate the food habits and the many *other* limitations operating among the various population groups within the area.

Then there is the problem, "What can we do about it?" The answer is one that must be arrived at individually. Each of us can broaden our own horizon of community life through continued self-education only to the extent that we as individuals choose to do so. The *need* for a greater public understanding of the work of the dietitian has been evidenced in our establishment of a public relations program and of our active participation in vocational guidance activities. But group activity is not enough. Transference of ideas is best accomplished by a personal approach. In every social as well as professional activity in which we engage we play a part in our public relations and vocational guidance programs. As we emerge from the protective shell of a too-limiting professional life, we will gain greater security and happiness in our own living, and we will become a *part* of rather than an *observer* of the community that is ours.

Dr. Henry Sigerist (1), in indicating what should be expected of a college graduate, presents a sound pattern for the dietitian to follow in becoming a true part of her community. She should strive to develop the following characteristics:

1. *Intellectual curiosity*, the thirst for knowledge. Do not take the world for granted but try to find out about it.
2. *Critical judgment*. Do not accept your teachers' words or the textbooks as authorities. Remember that they merely represent individual views. Do not be afraid of contradicting "authorities," if you think you have valid arguments. You must find the truth for yourself, and remember that this is a lifelong job.
3. *Imagination*. Experts will tell you what cannot be done. They may be right, but do not believe them. If you have ideas, stick to them. Progress begins with dreams and is achieved when they become reality. It is difficult to develop imagination in students but very easy to kill it.
4. *A correct sense of values*. Try to find out what is really important in life and what is not. And develop a positive attitude toward mental and physical health.
5. *Social consciousness*. Keep always in mind that you are a member of a society that grants you great privileges but toward which you have just as great obligations. Be ready to serve your fellowmen at any time with all your faculties, and remember that the welfare of the group is more important than your individual welfare.
6. *Correct use of the mother tongue*. Think clearly so that you may express yourself clearly. Enrich your vocabulary and your practical knowledge of grammar daily by reading the great past and contemporary writers critically.
7. *Knowledge of working methods*. Learn to attain knowledge through observation, experiments, correct reasoning, the use of books and other tools. Do not work haphazardly but planfully. Set yourself a definite goal periodically and work toward that goal systematically.

If we would become dietitians in *our* community rather than *a* dietitian in *a* community, we should analyze the limitations and the possibilities of the position which we now occupy. We should realize that, for living, a technical education is not enough; that specialization brings with it limitations as well as opportunities and that the extent to which we broaden our own horizon is a personal choice.

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CLEVELAND DIETITIANS WORK WITH HOSPITAL COUNCIL

ELIZABETH PERRY

Chief Dietitian and Assistant Superintendent, City Hospital of Cleveland

Dietitians in the last two years have frequently heard the expressions, "Public relations begin at home"; "Public relations are relations with the public"; and "The individual develops her own public relations." All of these phrases were coined in an effort to encourage the dietitian herself to develop good public relations. In addition to the importance laid on the dietitian's relations with co-workers as individuals, stress has also been put upon developing mutally beneficial contacts with allied organizations.

In Cleveland an excellent opportunity arose for dietitians to help both an allied organization and their co-workers, when the Committee on Dietary Problems of the Cleveland Hospital Council sponsored two meetings last year on purchasing standards for food for hospitals.

At the first meeting the subject of buying canned goods—both fruits and vegetables—was covered. To this meeting were invited the administrative officers, staff dietitians, dietetic interns, purchasing agents, and storekeepers of hospitals of the Hospital Council. Some seventy-eight attended.

The purpose of both meetings was, of course, educational. In particular, the first meeting had five objectives, namely to create in the minds of those attending a recognition of:

(a) The desirability of purchasing canned goods by specifications.

(b) The necessity of being sufficiently well acquainted with the various grades of merchandise so that when goods are delivered, they can be checked against the specifications included in the original purchase order.

(c) The importance of intelligent ordering so that canned goods will meet the specific requirements of the products to be cooked.

(d) The importance of requisitioning from the storeroom the quality needed for a particular use.

(e) The relative value of one grade as compared with another.

The program on canned goods included a discussion on specifications and an explanation in detail of the differences in grades, with demonstrations show-

The high cost of living

is shooting us all sky high!

When living costs rise like a rocket, that's every bit as bad for business as it is for customers. Fewer people buy when prices are too high.

In our own business we do everything we can to keep prices *down* and quality *up*. Once each month key men from all our companies sit down to plan new ways to increase efficiency and improve products—so you will get *top quality at lowest possible price*.

Here are some figures which show how milk prices compare with food prices, from 1939 to 1948:

Increase in cost of food . . . 116%
Increase in cost of fluid milk . 78%

Notice that milk has not increased nearly so much as the average of other foods. Our profit from all of our milk divisions averaged less than ½ cent per quart sold in 1947—far less than the public thinks business makes—and much less than the average profit in the food industry.

Milk—nature's most nearly perfect food—helps your budget by giving you more for your money than anything else you can eat. We guard the quality and nutritional values of milk, and cheese, butter, ice cream and other milk products. *Then we make them available to the largest number of people at the lowest possible prices.*

An impartial national survey shows that most Americans consider 10%-15% on sales a fair profit for business. Compared to this, the average profit for the food industry is less than 5%. And National Dairy's profit in its milk divisions in 1947 was less than 2%.

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ing the characteristics to look for in determining grades. One member of the Dietary Committee presented information on the uses of specific grades and showed the advantages of careful consideration of the cost, the grades, and the use to which a product is to be put.

Following the formal presentation, an informal discussion was held around long tables on which fifty-four samples were displayed. Sufficient time was allowed for those attending to evaluate the grades on display, and questions were asked, both as to grade and the use of one grade as compared to another. This discussion period also provided a chance to re-emphasize the fact that while it is desirable to purchase goods according to specifications, such a procedure is of little value if the dietitian, or some other person in the hospital, is not charged with the responsibility of determining whether the quality received meets the specifications.

At this program the importance of cooperation between all persons on whom responsibility rests for procurement, preparation, and use of food was pointed up. The storekeeper gained a better understanding of the demands of the dietitian for certain quality and grades, and the administrator became acquainted with the need for and the intelligent use of such food products. The interest of all segments of the group in the importance of determining quality when goods are delivered was clearly evident, and it was reported that after this meeting one or two hospitals rejected delivered merchandise because the pack did not meet the original specifications on the purchase order.

Following the meeting on canned goods, there were a number of requests for another similar meeting, which developed into a program dealing with various grades and cuts of meat. At this meeting, the person in charge pointed out briefly how the quality of meat can be determined and demonstrated with samples the differences that could be easily noted. In addition, he also discussed the uses to which certain cuts can be put. There was also a demonstration showing ground meat, ground chuck, and hamburger, and the group was told what constituted the differences between them. Throughout this discussion, the importance of weighing and inspecting all meat delivered was repeatedly emphasized. It was pointed out that if merchandise is not weighed on delivery, a variation in weight could easily influence the price paid, and if merchandise is not inspected for quality, a hospital might be paying for merchandise that was not of quality equal to the price.

To illustrate the discussion, a number of cuts of choice quality, good quality, and of commercial and utility grades were displayed.

The purpose of this particular display was to reveal the necessity of *specifying* the grade actually required. Samples of liver from cows, baby beefs, calves, pigs, and lambs demonstrated the differences between liver of different animals. Hams of different sizes were also shown, and an explanation was given of the difference in method of preparation of smoked hams and bacon, which proved to be of considerable interest.

A sheet containing suggested specifications for meat and the various cuts of meat was distributed to those present. Although some of the specifications may not be usable today because of the limited availability of meat supplies, nevertheless the merits of preparing specifications in the purchase of meat and meat products were well outlined.

A second sheet, prepared by the Dietary Committee, was also distributed, showing the various cuts and amount of savings which could be obtained. It was recognized, of course, that these savings would vary in different organizations.

These meetings were planned to point out the importance of good procedures in food purchasing; however, a great deal more was accomplished. In addition to promoting better quality food service and more efficient food administration among the hospitals, the meetings also served the purpose of pointing up the value of working closely with the various departments within the hospital to reach a common goal—good and efficient service. A definite desire to work together resulted with each segment of the audience recognizing and respecting the problems of the other departments. So popular were these programs, that in September a third meeting was held by request at which the problems of buying frozen fruit and vegetables were discussed. Other similar meetings are being planned for later in the year.

THE EARLY DAYS[1]

BERTHA E. NETTLETON

Product Representative, Institution Products, Consumer Service Department, General Foods Corporation, New York City

The development of home economics in the United States includes many important names and dates. Ketura Baldwin, in "The AHEA Saga," (1) recently quoted a passage from the writings of Socrates which was devoted to home and farm management. In it, he outlined the duties of a wife as suggested by her husband. Miss Baldwin felt that his comments were applicable to the well-run farm home of today. Socrates put these words into the farmer's mouth:

> I am paying into the common stock all that I have, and you have put in all that you brought with you and we are not to reckon up which of us has actually contributed the greater amount, but we should know of a surety that the

[1] Presented at the Annual Meeting of the New York State Dietetic Association at Lake Placid, New York, on June 7, 1948.

For the DIETITIAN . . .

A MEAT SUPPLY SERVICE

that's DISTINCTLY different

Have you often wished you might specify precisely the kinds and cuts of meats you want . . . and have those specifications rigidly adhered to?

You CAN; and, as a consequence, achieve greater economies of time and work, lower food costs, and an even higher standard of food service.

Pfaelzer Brothers have pioneered to its present perfection a specialized, PERSONALIZED SERVICE that has proven to be *the* answer to today's meat-buying problems. This service is "tailored" to satisfy *specific* requirements.

Unlimited resources . . . thoroughly modern facilities . . . an experienced staff of highly-skilled technicians with an understanding of, and a sincere interest in the dietitian's problems . . . all these add up to a PERSONALIZED SERVICE whose popularity is demonstrated by its ever growing number of dietitian users.

Your patients, staff and employees will be delighted with the greater eating satisfaction our service affords. You will be impressed with the LOWER FOOD COSTS, our eight PLUS VALUES insure.

You specify. *We* comply. Give our PERSONALIZED SERVICE a trial. You'll find it's the *modern* way to buy . . . meats, poultry, and food specialties.

CHECK LIST OF PFAELZER'S EIGHT PLUS VALUES

- √ ***A COMPLETE LINE*** of "tailor-made" meats, poultry, food specialties.
- √ ***UNIFORM QUALITY and WEIGHT AVERAGES.*** You receive *every* time, only as much meat as you order and the quality and weight averages you specify.
- √ ***DRY AGING*** enhances flavor and tenderness, absorbs meat's excess moisture, minimizes cooking shrink.
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- √ ***U. S. GOVERNMENT INSPECTION*** insures product wholesomeness.
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- √ ***THOROUGH PACKING and DRY-ICE*** refrigeration insure arrival in sanitary, fresh condition.
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Hospital Name.....

Dietitian's Name.....

City.....State.....

one who proves the better partner makes the more valuable contribution.

Your duty will be to remain indoors and send out those servants whose work is outside and superintend those who are to work indoors, and to receive the incomings, and distribute so much of them as must be spent, and watch over so much as is to be kept in store, and take care that the sum laid by for a year be not spent in a month. And when wool is brought to you, you must see that cloaks are made for those that want them. You must see, too, that the dry corn is in good condition for making food.

Let us choose the place that each portion should occupy. How good it is to keep one's stock of utensils in order, and how easy to find a suitable place in a house to put each set in. How beautiful it is to see cloaks of all sorts and conditions kept separate, or blankets, or brazen vessels, or table furniture!

In appointing the housekeeper, we chose the woman whom, on consideration, we judged to be the most temperate and who seemed to have the best memory, to be most careful not to offend us by neglecting her duties. We also taught her to be loyal to us by making her a partner in all our joys and calling on her to share our troubles. Moreover, we trained her to be eager for the improvement of our estate, by making her familiar with it and by allowing her to share in our success.

Long after Socrates, came Count Rumford's contributions to the philosophy back of the home economics movement. These have been recognized in many places. In fact, Ellen H. Richards titled her first publications, *Rumford Leaflets.*

IMPORTANT EARLY DATES

The first home economist of all was, I believe, Catherine E. Beecher who in *1822* established a private school for girls where she taught "domestic economy."

Then came Mrs. Mary Hemenway (*1863*) who succeeded in having cooking and sewing taught in one of the schools in Boston.

In *1872*, there was the passing of a legislative act which legalized sewing and other industrial education in the public schools of Massachusetts.

In *1873*, Maria Parloa gave public lectures in cooking in New London, Connecticut, and then a few years later, in 1879, she lectured in Boston in the cooking school that later became the Boston Cooking School of Fanny Farmer fame.

In *1874*, the New York Cooking School, with Juliet Corson as superintendent of the department, started in connection with the free Training School of Women.

In *1878*, Mrs. Sara Tyson Rorer started her school in Philadelphia.

In *1887*, Mrs. Mary J. Lincoln wrote the first school text book on cooking.

These are only a few of a list which all would recognize as making important contributions to early home economics.

Work on the college level started at Illinois Industrial University, now the University of Illinois, and at Iowa State and Kansas Agricultural Colleges in the early *1870's.*

Then the interest in institutional feeding developed. This was introduced by Mrs. Ellen H. Richards in Boston in *1894*, when she started the first school lunch in this country.

In the history of the progress of the movement, mention is made of two events that captured nationwide attention and had considerable publicity value. The first was the Centennial Celebration in Philadelphia in *1876*, where the Manual Training Movement for boys was widely publicized. The second was the World's Fair at Chicago in *1893*. This Fair had threefold significance for home economics. As a result of the Woman's Congress of the Chicago Exposition, the National Household Economics Association was founded. For ten years, this Association worked in promotion of efforts to raise the standard of living. It then merged with the Committee on Household Economics of the General Federation of Women's Clubs since the aims and objectives of the Association had become incorporated as one of the interests of the General and State Federation of Women's Clubs.

Also at this Chicago World's Fair, Massachusetts exhibited the Rumford Kitchen. This showed a workingman's home. It was planned and supervised by Mrs. Richards. In this exhibit, she tried to show how a family could live on $500 a year. (A man visiting the exhibit remarked, "This house may be run on $500 a year, but it would take a $5000 wife to do it.") Along with the demonstration home was a series of pamphlets prepared by leading authorities in scientific fields related to foods and nutrition. Here were papers by Professors Remsen, Howell, and Abel of Johns Hopkins University, Professor Chittenden of Yale, and Professor Sedgwick of the Institute of Technology.

At the Fair also, the United States Department of Agriculture showed a collection and analysis of food from all over the world. This stimulated the nutritional investigations under W. O. Atwater which were authorized by Congress in *1894*.

These sketches indicate the spread of individual and scattered but growing interest in the need for homemaking education and related activities. To quote from Miss Baldwin again, "[It] showed that in home economics as in any other field, the individual pioneers are the ones who bring something out of the nowhere into the here."

DEVELOPMENT OF LAKE PLACID CONFERENCES

So much for early background. Now for the events leading to the Lake Placid Conferences. In *1896*, the New York State Regents had decided to give household science a place in the examination for college entrance. Melvil Dewey, Director of the New York State Library, knew Mrs. Richards' fame

★ WHEN BULK-PRODUCING DIET IS NEEDED Nabisco 100% Bran provides a natural and delicious bulk-food—plus valuable B_1, Iron and Phosphorus. Appetizing served as cereal with fruits, milk and sugar! Wonderful in bran muffins!
★ FINER-MILLING gives Nabisco 100% Bran its *finer* particles—makes it milder, "easier-acting."
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READY TO EAT
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as a crusader in the problems of the home and invited her to the Dewey Summer Camp at Lake Placid to talk over the examination. Mrs. Richards was glad to have this opportunity to discuss her reforms with an educational leader.

The visits were repeated and, in *1898*, Mr. and Mrs. Dewey invited Mrs. Richards to speak on domestic problems before several Lake Placid Club members. Following this, in *1899*, the Conference Group was formed. So, informally, in a little Adirondack boathouse, the Lake Placid Conferences were begun. Eleven persons attended the first meeting. They were:

Ellen H. Richards, pioneer in home education, scientist, lecturer, author, and teacher.

Melvil Dewey, Executive Officer of the University of the State of New York and Director of the State Library and of Home Education of New York State.

Maria Parloa, Lecturer and Director, Tremont Street Cooking School.

Mrs. Melvil Dewey, charming hostess and wise counsellor.

Marie Daniell, pioneer in institutional management.

Emily Huntington, originator of the "Kitchen Garden" method of teaching housekeeping to children.

Anna Barrows, Editor of the *American Kitchen* magazine.

Alice P. Norton, Supervisor of Domestic Science, Brookline, Massachusetts, and later Head of the Department of Home Economics, University of Chicago.

Louisa E. Nicholass, organizer of the first household arts course at State Normal School, Framingham, Massachusetts.

Mrs. William G. Shailer, President of New York Household Economics Association, to represent the housekeeper's side.

Mrs. William V. Kellen, leader in the school lunch program in Boston, representing public welfare.

It is interesting to note on this list, two were concerned with quantity food service—Miss Daniell in the general field of institution management and Mrs. Kellen, leader in the school lunch program as a public welfare project. Miss Daniell gave a report on hospital dietaries at the *1900* meeting.

The Lake Placid Conferences continued for ten years with attendance by invitation of Mrs. Richards or Mrs. Dewey. Mrs. Richards was chairman of all the conference group meetings through the fall of *1908*, except the one held in Boston in *1903* when Abby Marlatt took the chair. The only other conference not held at Lake Placid Club was the one in *1908* which, by request, was held in Chautauqua, New York. At this conference, it was voted to make the organization national.

In the course of this meeting, Mrs. Richards reviewed the background of home economics as it looked then and Mr. Dewey attempted to plan its future. He suggested: first, that a large national organization be formed with a monthly or quarterly publication to keep members informed on important movements; second, that the field be expanded to cover "all that pertains to the general welfare and environment of the home"; third, that home economics cooperate in helping to develop mechanical devices to lighten housework; and fourth, that home economists participate in eliminating the needless waste between producer and consumer.

Throughout all of these conferences, Mrs. Dewey took an active part along with Mr. Dewey. Mrs. Dewey, with Mrs. Richards, prepared a syllabus on home economics for study clubs. Mrs. Dewey also reported a classification of home economics subjects for libraries.

In the proceedings of the second conference (in 1900), mention is made of several new topics. These include vocational and evening schools, extension work, and hospital dietaries.

At the third conference, the fifty-four persons attending represented public schools, colleges and universities, hospitals, magazines, the United States Department of Agriculture, women's clubs, and other organizations. Persons from Canada and England attended as well as from this country. The program included discussions of "Household Economics in Training Schools for Nurses" by Adelaide Nutting of Johns Hopkins University, and "Nutrition Investigations" by W. O. Atwater. There were other new subjects, too, such as "Journalism in Relation to Home Economics" by Janet M. Hill, Editor of the *Boston Cooking School Magazine*, and Anna Barrows, Editor of the *American Kitchen* magazine; "Women as Sanitary Inspectors," by Alice Ravenhill; and "Reading Courses for Farmers' Wives" by Martha Van Rensselaer, College of Agriculture, Cornell University.

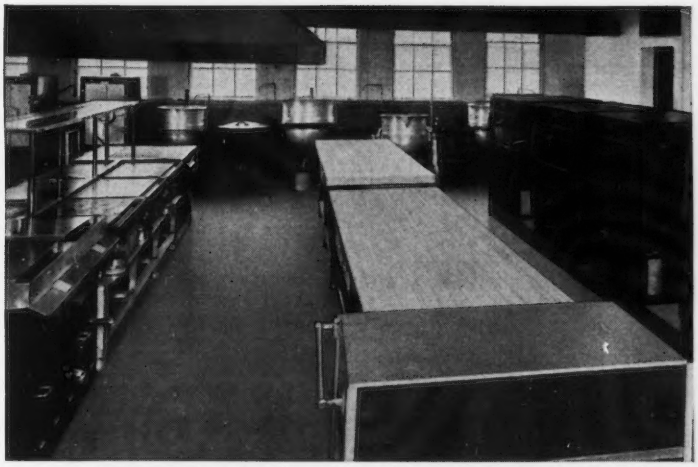
With each new year, the number attending the Lake Placid Conferences increased and the scope of subjects broadened with necessary shifts in emphasis. Such subjects as safe food, dietaries for students, protein metabolism, nutrition, the dietitian, public health, the school lunch, and home economics from a physician's standpoint were discussed, but always with the benefit to the family and home management as the objective.

AHEA IS ORGANIZED

Following the decision of the tenth Lake Placid Conference that a national group be formed, a conference was called by the Teachers Group of the Conference for December 31, 1907, to January 2, 1908, in Washington, D. C. This was attended by 143 delegates. There the present American Home Eco-

"Hotpoint Electric Equipment Repays Cost 3½ Times"

At left, Chief Chef Victor A. Ebding and assistant C. P. Fielder of Olive View Sanatorium.



Kitchen of Olive View Sanatorium showing modern Hotpoint equipment

Olive View Sanatorium Reports Amazing Results Of 11½ Years' Experience With Hotpoint Electric Equipment

IN 1936, Olive View Sanatorium (Los Angeles County, California) organized a committee to investigate the relative merits of various types of cooking equipment. They found that electric equipment offered these advantages: "Cooler, cleaner, requires less ventilation, easier to regulate, better control, safer, less meat shrinkage, less pot cleaning, decreased fuel consumption, and minimum temperature fluctuation."

They also found that: *"Almost without exception, all chefs who have used both fuels are enthusiastically in favor of electricity."* A short time later, Olive View Sanatorium installed a Hotpoint Electric Kitchen—including 4 double-deck roasting ovens, 1 range, 6 griddles and 2 fry kettles.

Today—after 12 years—Olive View reports that their Hotpoint equipment is still in perfect condition! Non-electric equipment previously used had to be replaced every 7 years. Maintenance cost, which had averaged 10%, now averages only ½%.

Tests conducted in the Olive View kitchen prove Hotpoint Ovens have cut meat shrinkage 4% to 9%—a savings averaging about $95.00 a month. For the 11½ year period to date, this totals approximately $13,100—enough to repay the original cost of the equipment over 3½ times!

Olive View also reports that improved working conditions have increased both efficiency and morale of kitchen help. Their Hotpoint Electric Kitchen is a full 15° to 20° cooler than with previous equipment—and free of fumes and soot. Management states that kitchen walls had to be repainted only once in 9 years—compared to every 2 years with non-electric equipment.

Space occupied by compact Hotpoint equipment is considerably less than with former equipment—and the cost of operating this equipment, as proved by Olive View's own records, averages only about seven-tenths of one mill per meal per person! Olive View reports, "We feel that the installation of Hotpoint electric equipment was the best step that could have been taken to improve our facilities and working conditions."

1. **Saves Food Flavors**—Conserves maximum of natural juices, gives uniform results.
2. **Cuts Food Costs**—Reduces meat shrinkage, saves up to 60% on consumption of fat.
3. **Cuts Labor Costs**—Saves hours for cook, saves on cleaning and scouring, too.
4. **Lasts Twice as Long**—Independent study shows depreciation rate is cut in half.
5. **Cuts Maintenance Costs**—Analysis shows annual costs average 1-1½% of investment for Hotpoint, 2-5% for most flame types.
6. **Saves Kitchen Space**—Compact, easy to install in most efficient arrangement without regard to chimneys.
7. **More Efficient**—Midwestern university tests show that Hotpoint equipment is 2.68 times more efficient than flame type.

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nomics Association was formed. Mrs. Richards was elected President; Isabel Bevier, First Vice-President; and Dr. Benjamin Andrews, Secretary-Treasurer. New emphasis was placed on standardizing the home, managing school lunch rooms, developing extension work, and hospital dietetics. The newly written objectives as drawn up at this early date stated, "The object of this Association shall be to improve the conditions of living in the home, the institutional household, and the community."

Thus from those early Lake Placid Conferences forty to fifty years ago, the American Home Economics Association was born. While it may not be accurate to say it is the parent of the American Dietetic Association, there are several among those who were active in its founding who were also charter members of the American Dietetic Associasociation.

REFERENCE

(1) BALDWIN, K.: The AHEA Saga. J. Home Econ. 38: 216, 1946.

New Appointments, Veterans Administration

The following hospital appointments of dietitians (not previously announced) have been made by the Veterans Administration:

Name	Position	Location
	Branch No. 1	
Rae Goldberg	Clinic Dietitian	Boston, Mass.
Rosamond Lynch	Staff Dietitian	White River Junction, Vt.
Evelyn Primes	Staff Dietitian	Framingham, Mass.
	Branch No. 2	
Virginia Dommermuth	Staff Dietitian	Halloran, New York
Winifred Paulin	Staff Dietitian	Halloran, New York
Rose Santandreau	Staff Dietitian	Halloran, New York
Eleanor Walsh	Staff Dietitian	Bronx, New York
	Branch No. 3	
Catherine Kelly	Staff Dietitian	Lyons, N. J.
	Branch No. 6	
Lois L. Good	Staff Dietitian	Cleveland, Ohio
	Branch No. 7	
Frances Adlis	Staff Dietitian	Hines, Ill.
Doris Benda	Staff Dietitian	Downey, Ill.
Rosemarie Brost	Staff Dietitian	Hines, Ill.
Mary J. Clements	Staff Dietitian	Hines, Ill.
Beverly A. Hallback	Staff Dietitian	Hines, Ill.
Margaret H. Kolze	Staff Dietitian	Hines, Ill.
Virginia M. Maiers	Staff Dietitian	Wood, Wis.
Lillian M. Nelson	Head Dietitian	Danville, Ill.
Althea Edler Rausch	Staff Dietitian	Wood, Wis.
Jeanette F. Smith	Staff Dietitian	Ft. Benjamin Harrison, Ind.
Beatrice Wanta	Staff Dietitian	Hines, Ill.
	Branch No. 8	
Marie Miller	Staff Dietitian	Ft. Meade, S. D.
Lucille Nanfelt	Staff Dietitian	Minneapolis, Minn.
	Branch No. 9	
Marie H. Boedges	Staff Dietitian	Jefferson Barracks, Mo.
Mary L. Chappelle	Head Dietitian	Topeka, Kans.
Mary McCann	Staff Dietitian	Jefferson Barracks, Mo.
	Branch No. 10	
Mary S. L'Herisson	Staff Dietitian	Alexandria, La.
	Branch No. 12	
Mary J. Keefe	Staff Dietitian	Los Angeles, Calif.
	Branch No. 13	
Wetona Adler	Staff Dietitian	Sheridan, Wyo.
Irene Hogan	Staff Dietitian	Ft. Lyon, Colo.

Army Announcements Concerning Personnel

The following Medical Department Dietitians were promoted during August, 1948:

Major to Lieutenant Colonel
Eleanor L. Mitchell, R-10035
First Lieutenant to Captain
Delaney, Isabelle, R-10044
Thornton, Margaret J., R-10077

Capt. Dorothy L. Wiltamuth, a former dietitian, has been called to active duty in the Officer Reserve Corps for a period of ninety days.

The War Department has released the following official list of names of Medical Department Dietitians (not previously announced) who have been separated from service:

Kipp, Nancy L., R-2397, 1863 Clarkson St., Denver 5, Colo.
Loudon, Dorothy H., R-1266, Dickinson, N. D.
Sims, Jane F., R-932, 2712 Mission St., Ft. Worth, Tex.
Zimmerman, Donna P., R-2403, Chiloquin, Ore.

NUTRITIOUS and RESIDUE FREE

Yet Highly Palatable

The soft, easily digested, residue-free diet so often required in the management of the aged need not be colorless, tasteless, and drab. Through the addition of Malt-o-Meal, delightful taste appeal is readily added. A wheat cereal flavored with toasted malt, Malt-o-Meal provides the excellent nutrient content of wheat as well as added significant amounts of thiamine, riboflavin, niacin, and iron. It is easily digested, residue free (fibre content, 0.4%), and chemically bland. Its palatable taste is enjoyed by older patients, hence it may be eaten daily or more often if necessary. Malt-o-Meal finds ready application in many derangements which characterize the aged—chronic gastritis, decreased digestive ability, mastication and deglutition difficulties, reduced gastric capacity, intolerance to foods difficult to digest, colitis, and anorexia.

CAMPBELL CEREAL COMPANY, Minneapolis, Minn.

Malt-o-Meal

Malt-o-Meal, an enriched wheat cereal flavored with toasted malt, provides per ounce (dry weight), 0.29 mg. of thiamine, 0.13 mg. of riboflavin, 1.09 mg. of niacin, and 2.00 mg. of iron. Thus Malt-o-Meal provides appreciably more thiamine, riboflavin, and iron than does whole wheat, and 78% of the niacin content of whole wheat.

Book Reviews

A Handbook on Diseases of Children Including Dietetics and the Common Fevers. By Bruce Williamson. 5th ed. Baltimore: The Williams & Wilkins Company, 1947. Cloth. Pp. 408. Price $4.50.

This book by a British author is intended to be a guide to the general practitioner and is by no means as inclusive as are many textbooks on pediatrics. It is convenient, concise, and written in an easy-to-read style. In it are discussed the diseases of the various body systems together with information concerning disorders of the endocrine glands, blood, bones and joints, muscles, and skin. There are several chapters devoted to common fevers and infections, disorders of nutrition and metabolism, infant welfare and dietetics, and artificial feeding.

The author emphasizes the importance of diet in antenatal care as well as during infancy and childhood. One cannot help but wish that he had reinforced this emphasis with specific and practical dietary considerations throughout childhood. There are no tables of nutritive requirements for children of various ages, and no suggestive meal patterns are given to guide the physician in making his dietary recommendations. An adequate discussion of the normal diet could have done much to aid the physician in the intelligent planning of diet for various disease conditions. As it is, the one- or two-sentence descriptions of diet indicated for the several disorders are not only vague, but fail to indicate the seriousness of an inadequate diet during illness and convalescence.

The material concerning nutrition has not been consistently revised to include relatively recent research, and there are occasional instances of misleading, non-specific, and inaccurate statements. For example, in the summary of the vitamins (page 129) the food sources are given in general and often unequal terms; the claims for some of the vitamins are not wholly justified; and the grouping of riboflavin and niacin together as one vitamin is confusing to say the least. Some of the newer B-complex factors are not mentioned. In the chapter concerning artificial feeding there are brief instructions for the calculation of the formula, but the details concerning the time for introducing various food supplements together with the possible requirements are largely missing even though the author recognizes the need.

This book may be useful as a reference to the dietitian who wishes an overall picture of disease conditions in childhood and their general treatment, but it is doubtful whether it will enhance greatly the knowledge or appreciation of dietetics for either the physician or the dietitian.—*Corinne Robinson, Lecturer in Nutrition, Temple University School of Medicine, Philadelphia.*

You Can Be Thin: Slenderness Through Psychology. By Herman Friedel, M.D. New York: Caxton House, Inc., 1948. Cloth. Pp. 117. Price $2.

The author proposes a program of reducing based on psychological fact as well as food values. The two purposes of the book are to help the patient acquire the necessary insight into psychological problems and to suggest a safe, sure, scientific reducing diet—"not the sort of one a martyr would find difficulty in keeping."

The reader is encouraged to make a self-analysis of his own psychological difficulties. In order to gain the necessary insight to do this, the author suggests that the patient consider for himself certain possibilities, such as insecurity, habit, lack of a vital interest, fear, and poor food selection.

Since much of the problem of reducing is one of habit-breaking, a "five-point program" is outlined as follows: first, develop an engrossing interest; second, commit yourself to a diet; third, focus on the penalties of failure and the rewards of success; fourth, start the diet at once; and fifth, allow no exceptions. Each one of these points is logically presented, amplified, and clarified with case histories.

The psychological principles are indeed presented in simplified form, but for the most part the ideas are accurate and the suggestions practical. No effort is made to minimize the effort that has to be exerted to lose weight, nor is the outlook made to look overly optimistic.

In the latter half of the book, the author's intentions seem to have been good in presenting a scientific reducing diet; but numerous inconsistencies will confuse a critical reader. For example, emphasis is given to the use of protective foods by the following recommendations:

(a) Drink three or four cups of milk a day.

(b) Have one serving a day of yellow vegetables and of leafy green vegetables.

(c) Have at least two servings a day of other vegetables and fruits—one of a citrus fruit.

(d) Eat at least four eggs a week (cooked soft, preferably).

(e) Help yourself to one or two servings of whole grain cereal products.

(f) Eat meat—or some other high-protein food—once a day.

Actually none of the menus in the book contain as much as three glasses of milk a day, and meat or some other high-protein food is recommended twice a day rather than once. On one page the reader is told to do penance if ice cream is eaten. On another page ice cream appears on the approved menu outline.

This same inconsistency occurs in the use of preserved fruits and salad dressings. While dressing appears on the "avoid" list, in one menu outline it is recommended six days out of seven. It is interesting that mineral oil salad dressing is recommended on one day's menu in spite of the fact that its use with food has been discouraged for some years by the Council of Foods and Nutrition of the American Medical Association.

It is to be regretted that the author did not develop his original intent of making the diet as "tolerable" as possible. Greater individualization and elasticity in food selection would have been accomplished by individualization in the caloric level selected for reducing purposes. Also, by offering greater variety in food selection, it would have been possible to meet the various socio-economic needs of the individual.

Good Eating at Less Cost!

*Full-year field check by 19 Universities** establishes significant data on food costs. Study compares COSTS AND AVAILABILITY of 12 commonly used Fruits and Vegetables in their four marketable forms—Fresh, Frozen, in Glass and in Cans.

In these days of high prices, don't people seeking your guidance constantly ask: "How can I get more food value for my food dollar?"

19 leading American universities sought the answer in a 12-months' research project — October, 1946 through September, 1947. The results of this comprehensive study on the 12 fruits and vegetables boil down to this: *Penny for penny, canned foods in general give consumers more food for their money, as well as more nutritional values. Most foods in cans cost less than the same foods in glass—less than fresh foods —and far less than frozen foods.* For example, study the "Peas per Penny" chart at left.

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As you know, no matter how good a particular food may be nutritionally, if it is not readily available, or if the price is high—that food is of very little practical value. Therefore, the known nutritional values of food in cans, plus the *high* percentage of year-round availability and the *low* cost of canned foods in general, are a winning combination.

SOUND RECOMMENDATION

Results of this pioneering coast-to-coast research again demonstrate how important canned foods are in relation to improved national nutrition. Their variety, their convenience for storage and use in the home, together with their availability and economy, constitute a sound basis, we believe, for your recommending this solution to today's high cost of living.

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Please send me, free of charge, ____ copies of the new booklet entitled: "Canned Foods in the Economic Spotlight." E

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*For full details see "Comparative Cost and Availability of Canned, Glassed, Frozen, and Fresh Fruits and Vegetables" in the April issue of the *Journal of the American Dietetic Assn.*

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Medical Writing: The Technic and the Art. 2nd ed. By Morris Fishbein, M.D. Philadelphia: The Blakiston Company, 1948. Cloth. Pp. 292 plus x. Price $4.

This "how to do it" book by the dean of medical editors (the author has been Editor of the *Journal of American Medical Association* for some twenty-odd years) deserves to be not only read but parts of it studied carefully by all persons who wish to contribute to scientific and professional publications. The chapters which deal in general terms with writing cover the major problems which arise in editing professional publications.

The discussion on the competition among authors for space in periodicals and the difference between papers prepared for delivery at meetings and those prepared specifically for publication are both cogent and pertinent and should be "must" reading for any would-be author. The chapter on "style" in which the author takes up such subjects as "Fine, or Fancy Writing," "Verbosity," "Poor Grammar," "Correlatives," "Slang," "Keeping Same Point of View Throughout Paper," "Use of Nouns as Adjectives," and "Acquiring a Good Style," would be germane in any book on writing in general.

The chapters on the construction of tables and charts and on the preparation of illustrations should be most helpful to authors and, if the suggestions are followed, should serve to make the editor's job easier. On the other hand there are descriptions of engraving processes which might serve only to confuse rather than help authors.

Approximately half of the book is concerned with the technical style of the publications of the American Medical Association, which may or may not apply to other professional publications. Every publication follows its own individual style, i.e., as to treatment of numbers (whether written out or printed in figures), capitalization, hyphenation in cases where standard dictionaries do not supply help, and so on. For authors who wish to prepare manuscripts for publications other than those of the A.M.A., the sections on spelling, capitalization, abbreviations, and numbers may be of questionable value. If the style recommended in this book is followed and a manuscript accepted by another publication, the author may find that many changes must be made because that journal's style is different. Particularly, on the subject of hyphenation the author explains that the American Medical Association Press has adopted "the policy that hyphens are not necessary when the meaning of double or compound words is clear without them." While the reasoning behind this policy is perfectly plain and logical, it is not yet common usage and following such a policy might be contrary to the style of other publications.

Standard usage on matters of style are covered in a number of style books which are easily available, i.e., the University of Chicago's *A Manual of Style*, and the *Government Printing Office Style Manual*. However, for those authors who may use only this book as a reference in preparing manuscripts, the material on style will undoubtedly be helpful.

Large Quantity Recipes. By Dorothy Glenn. Chicago: National Association of Retail Grocers, 1947. Paper, spiral bound. Pp. 140. Price $3.50.

Although the recipes in this book have been selected especially for large retail food stores operating delicatessen departments, they may very well be used in any establishment preparing food in large quantities.

The recipes were chosen not only for their sales and appetite appeal, so that the dishes may be sold at greater profit and in large volume, but also for their low cost of preparation. They almost all utilize low cost ingredients which may be "dressed up" for profitable sales.

The recipes were obtained through the courtesy of the authors of the U. S. Navy Cook Book, General Foods Sales Corporation, Armour and Company, and Lenore Sullivan. They have been tested for workability and yield, but are lacking in unit standardization.

Space is given to "prepackaging of delicatessen foods"; "freezing cooked foods"; and "display and merchandising." The following tables are included: weights and approximate equivalents of some common foods; weights and yields of canned vegetables; and equivalents for fresh, evaporated, and powdered whole or skim milk. Cookery terms are also defined.—*Mary Rido, Administrative Dietitian, Cook County Hospital, Chicago, Illinois*

Foods and Nutrition Workbook. By Alberta Dent. Ithaca, N. Y.: Edward Brothers, 1947 (Order direct from Alberta Dent Shackelton, 914 E. State St., Ithaca, N. Y.). Paper, spiral bound. Pp. 164. Price $1.75 plus postage.

This workbook is planned to assist students in the first college course in foods and nutrition. It follows the unit organization of the revised edition of *Elements of Food and Nutrition* by Dowd and Dent. One hundred and six problems are given which emphasize the nutritive value of various foods and their contribution to the diet, the construction of a diet adequate for an individual or a family group and the relation of the cost of food to nutritive value. Some are problems in mathematics, while others are activities to be carried out by the student. Many are thought-provoking problems, which should aid students in learning, not only the facts of nutrition but also practical dietetics.

The books seems well suited to accompany the text for which it is planned. It may also be used with other elementary texts. Certain problems may well be selected and used to stimulate thought in more advanced classes.—*Catherine L. Newton, Professor of Home Economics, The University of Georgia, Athens.*

100 to Dinner. By Elsbeth Middleton, Muriel Ransom, and Albert Vierin. Toronto, Canada: University of Toronto Press, 1948. Paper, spiralbound. Pp. 342. Price $3.50.

The preface states, "This book is the result of research undertaken by the authors during World War II to provide the simplest and best recipes and directions for food prepared in large quantities, and which would result in the most attractive and nourishing meals. Every recipe in the volume is the fruit of prolonged testing and may be relied upon. They are in quantities for 100 to 125."

Miss Middleton and Miss Ransom are well-known home economists; Mr. Vierin was for many years Executive-Chef, under Violet Ryley, in the T. Eaton Co., Toronto.

The recipes and methods stated should prove of value not only to those entering the business of feeding the public, but also to the experienced cook.

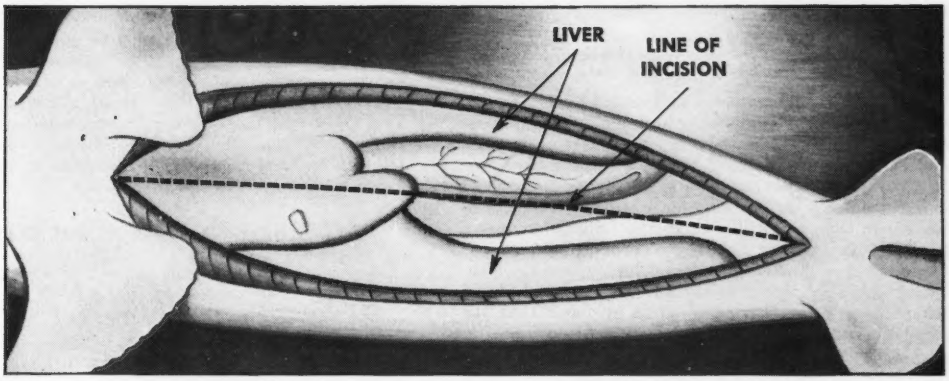
Ascorbic Acid Requirements

Studies at the Louisiana Experiment Station which were recently reported suggest that the human requirement for ascorbic acid varies with the size of the individual. This work showed that the ascorbic acid level in blood plasma of smaller, lighter-weight people was higher than in larger, heavier people on the same diet. The range was from 61 mg. per 100 cc. in one person weighing only 132 lb. to as low as 30 mg. per 100 cc. in another weighing about 167 lb., both having the same intake of ascorbic acid.—*From Food and Home Notes, March 10, 1948.*

Notes of interest on Borden's widespread Food Activities

How a hepatectomy is performed on sharks

—in order to get Vitamin A



Shark fishing in the tropical waters of the Western Hemisphere has become a sizable industry, for shark liver is one of the best sources of Vitamin A.

The Borden Company, because of its widespread activities in the food field, requires large quantities of Vitamin A. To assure its sources of supply, it operates a large fishing fleet. Borden boats are at sea every day. Using four 3600 foot lines, 100 hooks to the line, they catch from nothing to 300 sharks daily.

Incision Made

Each shark on being brought aboard the vessel is killed and then suspended on a block and tackle. A cut, deep enough to sever the integument, is then made on the ventral aspect of the shark. This cut is started slightly below the left lateral pectoral fin and is continued caudad to a point roughly one to two feet from the caudal fin.

The liver is then severed of its blood vessel and ligament connections and removed. The weight of the liver varies anywhere from 10 to 30 per cent of the total weight of the shark (15 pounds to 300 lbs.). 50 to 70 per cent of the shark liver by weight is oil which contains Vitamin A.

Storage and Extraction

The excised livers are stored aboard the vessel under refrigeration while at sea, and are kept fresh until they reach The Borden Company's vitamin laboratory at Salerno, Florida, one of five maintained by Borden's.[1] Here the Vitamin A bearing oil is extracted from the liver by a saponification process. This oil is further refined and concentrated at a separate plant.

Controlled Results

This Vitamin A oil is tested not only by Borden's, but by outstanding independent research laboratories for confirmation before any is released to the pharmaceutical field.

From this supply of quality controlled Vitamin A shark oil Borden's also fortifies the poultry and animal feed supplements it makes. These include dairy feeds which help produce a higher content of Vitamin A in milk. These Vitamin fortified feeds help safeguard the health of the cows to which they are fed and prevent many stillborn calves and other breeding mishaps.

This is another instance of how The Borden Company is constantly striving to provide better nutrition through widespread food activities.

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[1]*Other Vitamin laboratories are located at Bloomfield, N. J.; Waterloo, Iowa; Hampshire and Elgin, Ill.*

Current Literature

Contributed by Janette C. Carlsen, Janet Engebretsen, and Ethel M. Miller, Dietary Department, The Johns Hopkins Hospital; Mrs. Quindara Oliver Dodge, Women's Educational and Industrial Union, Boston; Mrs. Corinne Robinson, Temple University School of Medicine, Philadelphia; and the Journal Staff.

AMERICAN HEART JOURNAL

Vol. 36, August, 1948

*Electrocardiographic changes in typhoid fever and their reversibility following niacin treatment. M. Rachmilewitz and K. Braun.—p. 284.

Electrocardiographic Changes in Typhoid Fever. Serial electrocardiographic examinations were made in fifty cases of typhoid fever. In thirty-five of these cases alterations were observed mainly in the T waves. Twenty-three patients with T wave changes were given 300 to 600 mg. of niacin daily which resulted in normalization of the electrocardiogram in two to ten days. In the remaining twelve cases a spontaneous gradual return to normal was observed. The rapid effect of niacin and the development of the electrocardiographic changes concomitant with reduced niacin excretion in the urine is considered as evidence that the described abnormalities are due to niacin deficiency.

THE AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 15, August, 1948

*Vitamins and hormones in nutrition. IV. Gastro-intestinal disease and reduced dietary intake. B. F. Sieve.—p. 275.

Gastrointestinal Disease and Reduced Dietary Intake. Gastrointestinal disease and reduced dietary intake constituted the chief predisposing causes in 67 per cent of a series of 200 cases of nutritional disorders. Gastrointestinal disease may be the primary result of specific pathology in the gastrointestinal tract, or secondary to systemic disease which can be controlled indirectly by vitamin and endocrine therapy. A careful, detailed history, with particular reference to food habits and attention to the condition of the mouth, may uncover unsuspected reasons for reduced dietary intake. Consideration of the patient as a whole, with particular attention to the presence of infection and to the vitamin-hormone balance, usually provides the key to proper substitution therapy, which should supplement a well balanced diet. The importance of two new therapeutic agents is discussed: a capsule containing the whole liver factor with lipoids of liver and a highly concentrated hydrolyzed protein powder.

AMERICAN JOURNAL OF SURGERY

Vol. 76, August, 1948

*Transitory hypoproteinemia in acute severe fractures. B. J. Ficcara.—p. 201.

Hypoproteinemia in Fractures. Twelve patients with acute severe fractures were studied. All had been in good health prior to injury. None of these patients had severe blood loss, and none were in shock. The initial determination of blood protein made as soon as the patient was admitted to the hospital showed lowered levels (4.0 to 5.0 gm. protein per 100 cc. blood) but within 12 hr. the concentration of protein had returned to normal (6.0 to 7.0 gm. protein per 100 cc. blood). Hematocrit determinations showed normal values before and after treatment of the fracture. The uric acid level remained normal, indicating that there was no tendency to excessive endogenous protein metabolism. The transitory hypoproteinemia was attributed to local protein loss due to tissue destruction and excessive urinary nitrogen excretion.

BRITISH MEDICAL JOURNAL

No. 4561, June 5, 1948

*Lipotropic factors in experimental cirrhosis. E. A. Sellers, C. C. Lucas, and C. H. Best.—p. 1061.

No. 4570, August 7, 1948

*Caffeine and gastric secretion. D. R. Wood.—p. 283.

Lipotropic Factors in Cirrhosis. A moderate degree of cirrhosis was produced in young adult rats by the administration of carbon tetrachloride. These rats were placed on diets containing different amounts of the following lipotropic agents: choline, methionine, protein (containing methionine), and inositol. None of the animals receiving only a basal hypolipotropic ration showed improvement in the cirrhosis. When adequate amounts of pure choline chloride or *dl*-methionine were added to the basal hypolipotropic diet, a remarkable improvement in the gross appearance of the livers was noted within two or three weeks. After two or three months of this treatment, the livers appeared normal. A high-protein diet, containing 35 per cent protein but low in methionine, was not as beneficial as a ration containing 20 per cent of similar protein to which adequate supplements of choline or methionine had been added. A high-protein diet which contained an adequate amount of naturally-occurring methionine produced results as favorable as those which were obtained when suitable amounts of choline or methionine were added to diets of lower protein content. No evidence has been obtained that inositol exerts a favorable effect on experimental cirrhosis. On the basis of the experimental findings it is suggested that the favorable clinical results which have been obtained in patients with liver damage when an effective therapeutic diet has been provided, may be attributable in large part to the lipotropic factors which the diet supplies.

Caffeine and Gastric Secretion. The effects of caffeine on gastric secretion have recently been investigated in animals and in man, and although there is a wide variation in sensitivity between species, it appears that caffeine stimulates gastric secretion in man, cat, guinea pig, and dog. The vascular and cellular changes due to caffeine may make the mucosa more susceptible to the proteolytic action of acid and pepsin secretion. It is not justifiable to conclude

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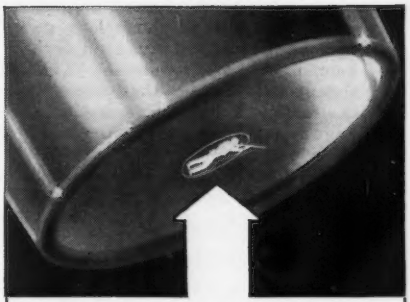

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from these experimental results in animals that caffeine can cause peptic ulceration in man. It is known, however, that after a caffeine test meal, secretion of gastric juice is greater and more prolonged in ulcer patients than in normal subjects.

BULLETIN OF THE JOHNS HOPKINS HOSPITAL

Vol. 83, September, 1948

*Effect of para-aminohippuric acid on sodium thiosulfate determinations in renal clearance studies. S. R. Elliott, II, and H. W. Scott, Jr.—p. 213.

*Observations on the effect of folic acid antagonists, folic acid, liver extract and vitamin B_{12} on embryonated eggs. P. F. Wagley and H. R. Morgan. —p. 275.

Renal Clearance Studies. For the determination of effective renal plasma flow and the functional capacity of the tubular excretory system, para-aminohippuric acid was used. Sodium thiosulphate was employed to measure glomerular filtration, as it has many advantages over inulin and mannitol clearances. It was concluded that in the presence of high concentrations of para-aminohippuric acid false elevations of sodium thiosulphate occur. The time element which exists between filtration and titration must be carefully controlled, and the time varies with the concentrations of para-aminohippuric acid.

Folic Acid. Six- to eight-day-old chick embryos were inoculated with three folic acid antagonists, with folic acid, with purified anti-pernicious anemia liver extract, or with vitamin B_{12}. All eggs injected with folic acid antagonists showed a decreased survival time. When vitamin B_{12} or purified liver extract was given prior to the antagonist, no change was noted in survival time; but when folic acid was administered, the survival time appeared to increase. Although this is only a preliminary study, a better understanding of folic acid in human beings may result.

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 58, June, 1948

*Relationship between impairment of liver function and premature development of arteriosclerosis in diabetes mellitus. I. M. Rabinowitch.—p. 547.

*Nutrition in pregnancy. H. Simonnet.—p. 556.

Liver Function and Arteriosclerosis in Diabetes Mellitus. The data presented here are consistent with the view that impairment of the detoxifying capacity of the liver is a factor in the premature development of arteriosclerosis in diabetes mellitus. In the absence of a normally functioning liver, products of intestinal putrefaction, which would otherwise be detoxified, reach the general circulation, damage the tissues, and thus tend towards the premature development of arteriosclerosis. The findings are not inconsistent with the view that excess cholesterol in the blood is a factor. It is possible that the same cholesterol which is eventually deposited in the blood vessels also damages the liver.

Nutrition in Pregnancy. A discussion of the nutritional requirements for pregnancy are presented, including trace elements, the role of the placenta, fetal reserves, and anemia as well.

ENDOCRINOLOGY

Vol. 43, July, 1948

*Influence of the diet upon the nephrosclerosis, periarteritis nodosa and cardiac lesions produced by the "endocrine kidney." H. Selye and H. Stone.—p. 21.

Endocrine Kidney Effects. Experiments on the rat indicate that the production of hypertension and its morphologic accompaniments by the "endocrine kidney" technique are uninfluenced by the protein and sodium chloride concentration of the diet. These findings are contrasted with those in which pathologic changes were caused by administration of desoxycorticosterone or anterior-pituitary extracts, only if the animals were kept on diets rich in sodium chloride. Conversely, diets poor in sodium chloride protected the animals against the pathologic changes. High-protein diets did not influence the production of hypertensive disease by desoxycorticosterone, but they markedly increased the same effect by crude anterior-pituitary extracts. From these experiments it is apparent that the diet influences the "endocrine transformation" of kidney tissue under the influence of these hormonal stimuli, but the secretion and action of renal pressor hormones themselves remain uninfluenced by the sodium and protein intake.

INDUSTRIAL MEDICINE

Vol. 17, August, 1948

*A survey of eating habits, American Can Company.—p. 283.

A Survey of Eating Habits. This survey gives a picture of the food habits of the workers in the Hamilton, Ontario, factory of the American Can Company. The average worker eats enough meat and other protein foods, but he does not choose enough milk, fruit, vegetables, or whole grain cereals. This condition is true of the average Canadian. An improvement in food habits, over a period of time, has resulted in improved health both physical and mental. The source of help and inspiration for improving the workers' food habits and health was the company's Medical Department, where the welfare of the worker underlies all policies and practices.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 175, August, 1948

*Studies on carotenoid metabolism. IX. Conversion of carotene to vitamin A in the hypothyroid rat. C. E. Wiese, J. W. Mehl, and H. J. Deuel, Jr.—p. 21.

*Studies on amino acid excretion in man. I. Amino acids in urine. A. L. Sheffner, J. B. Kirsner, and W. L. Palmer.—p. 107.

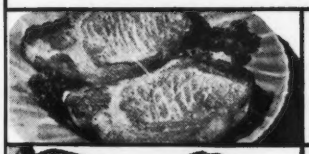
*The effect of severe heat treatment upon the amino acids of fresh and cured pork. J. F. Beuk, F. W. Chornock, and E. E. Rice.—p. 291.

Methods for determining the iron content of milk. F. A. Johnston, N. Gellman, and J. Strom.—p. 343.

Carotenoid Metabolism. This experiment was designed to demonstrate the lowest level of carotene and vitamin A which would support growth in a thiouracil-treated animal and the level which would give maximum growth. Rats which were rendered hypothyroid by the inclusion of thiouracil in the diet responded to administration of vitamin A and carotene by increased growth and by alleviation of ocular symptoms. The carotene and vitamin A were about equally well utilized by the hypothyroid rats at low levels of intake of vitamin A and carotene. When the rate of growth was limited by thiouracil feeding, it could be restored to normal by thyroxine but not by large doses of vitamin A. The survival time of rats on a diet deficient in vitamin A was much prolonged when the animals were rendered hypothyroid by thiouracil feeding.

Amino Acid Excretion. This study was based on the suggestion that measurements of the intake and excretion of individual amino acids might supply more complete and significant data than the conventional nitrogen balances alone. The ingestion, blood levels, and excretion in urine of eight amino acids were measured microbiologically in two normal adult men receiving a normal intake of protein. The eight amino acids investigated were: leucine, isoleucine, valine, threonine, arginine, histidine, lysine, and methionine. The preparation of diets and the experimental procedure are described. As a result of this study it was found that the two subjects excreted in the urine a quantity of microbiologically available amino acids equal to 2.46 per cent of the amount ingested. The renal tubules selectively reabsorbed amino acids.

The Abundant Nutrient Values of MEAT

KIND OF MEAT	COMPLETE PROTEIN	B VITAMINS			FOOD IRON
		THIAMINE (B_1)	RIBOFLAVIN (B_2)	NIACIN	
 PORK	EXCELLENT	EXCELLENT	FAIR	EXCELLENT	EXCELLENT
BEEF	EXCELLENT	FAIR	EXCELLENT	EXCELLENT	EXCELLENT
LAMB	EXCELLENT	FAIR	GOOD	EXCELLENT	EXCELLENT
VEAL	EXCELLENT	GOOD	GOOD	EXCELLENT	EXCELLENT
VARIETY MEATS (LIVER, HEART, KIDNEY)	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
SAUSAGE (FRANKFURTERS, BOLOGNA)	EXCELLENT	GOOD	GOOD	GOOD	EXCELLENT

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Effect of Heat on Amino Acids in Pork. On the basis of experimentation with animals, heat has been shown to have a deleterious effect on proteins. There have been few investigations, however, of the conditions normally existing in the preparation of edible meats. The use of extreme conditions similar to those which have been shown to reduce the biological values of dry proteins offers a means of estimating the significance of losses which may occur in normal processing. This technique has been applied in the study of the effect of heat upon the amino acid content of fresh and autoclaved pork. It was found that severely treated pork failed to show losses of amino acids other than cystine. It seems improbable, then, that ordinary cooking or processing operations would destroy any significant amounts of amino acids except cystine. Experiments showing decreases in the digestibility of enzymes suggested that the milder processes of home or commercial cooking may likewise decrease digestibility, but that the changes may not be detectable under normal conditions.

THE JOURNAL OF CLINICAL INVESTIGATION

Vol. 27, July, 1948

*Nitrogen balance studies on the Kempner rice diet. W. B. Schwartz and J. K. Merlis.—p. 406.

Nitrogen Balance Studies of the Kempner Rice Diet. Nitrogen balance was studied in six normotensive subjects on the "Kempner rice diet," which by analysis was found to contain 2.63 gm. nitrogen per day. After eight days on the diet, analysis was made. The excretion was greater than the intake by an average of 3.22 gm. nitrogen per day. The "rice diet" shows no unusual ability to satisfy the nitrogen requirements of the body. There was clinical improvement of the subjects although no nitrogen equilibrium was maintained.

THE JOURNAL OF PEDIATRICS

Vol. 33, July, 1948

*The effect of oral feeding at different levels on the absorption of foodstuffs in infantile diarrhea. A. W. Chung.—p. 1.

*The effect of early oral feeding versus early oral starvation on the course of infantile diarrhea. A. W. Chung and B. Viscorova.—p. 14.

Absorption of Foodstuffs in Infantile Diarrhea. The absorption of nitrogen, fat, total ash, sodium, potassium, calcium, and chloride was followed in six subjects with infantile diarrhea on normal and on reduced food intakes. It was found that absorption of each food ingredient was improved on the higher intakes, even though the fecal loss was increased. These studies indicate clearly that effective intestinal absorption of all foodstuffs occurs even in the severest of diarrheas and that the absorption is roughly proportional to the intake. Unless it can be shown that a high intake is in some way deleterious or delays recovery, it would seem desirable to feed such infants liberally and to disregard the appearance of the stools.

Oral Feeding or Oral Starvation and Infantile Diarrhea. Data have been presented on 115 patients with infantile diarrhea studied at the University Children's Clinic, Bratislava, Czechoslovakia. Of this group, twelve died, a mortality of 10.4 per cent. The remaining 103 patients were divided into two groups. One group was offered full feedings from the start; the other group was placed on a regimen of oral starvation. The duration of the diarrhea was not prolonged under the feeding regime. There was a more prompt and consistent weight gain in those who were fed, in spite of the larger volume of stool excreted. The evidence presented by this clinical study substantiates the metabolic findings of the preceding paper: that it is advantageous to feed the diarrheic infant early with full calories rather than to follow the conventional treatment of oral starvation.

THE LANCET

Vol. 254, June 5, 1948

Vitamin-C requirement of human adults. Experimental study of vitamin C deprivation in man. A preliminary report by the Vitamin C Subcommittee of the Accessory Food Factors Committee. Medical Research Council.—p. 853.

Vol. 255, July 3, 1948

* Malarial diabetes. L. Rau.—p. 11.

Vol. 2, August 7, 1948

*Cirrhosis of the liver in Ceylon and its relation to diet. P. B. Fernanco, O. R. Medonza, and P. K. Rajasuriya.—p. 205.

Malarial Diabetes. Malaria in the capillaries of the islets of Langerhans will cause diabetes which may be controlled by diet and insulin. The diabetes may be relieved by specific anti-malarial treatment. Two cases are presented.

Cirrhosis of the Liver. The incidence of cirrhosis of the liver in Ceylon appears to be intermediate between its incidence in Europe and in India. Of the 102 cases reviewed, fifteen were toxic. Eight of these fifteen cases were individuals who had been on a good diet, and the cirrhosis apparently followed infectious hepatitis. In six instances, a long period of protein deficiency had preceded the onset of the cirrhosis and appeared to have been concerned in the pathogenesis. The remaining eighty-seven cases were Laennec's cirrhosis. Malaria, dysentery, and dietary conditions evidently played no part in the causation. In 48.8 per cent of forty-three patients for whom a detailed dietary history was available, the cause of cirrhosis appeared to be fatty infiltration of the liver due to lipotropic deficiency in the diet; in 27.9 per cent of this group, the cirrhosis was apparently due to alcoholism. In the remaining 23.3 per cent the cause was not determined.

THE NEW ENGLAND JOURNAL OF MEDICINE

Vol. 239, July 15, 1948

*The economics of infant and child nutrition. N. B. Talbot, C. C. Koo, W. W. Pick, and S. L. Wells.—p. 79.

The Economics of Infant and Child Nutrition. A brief survey is presented of the approximate, relative costs of feeding infants various types of formula, and of feeding children cereal-vegetable-fruit diets vs. diets of equal caloric and protein content containing animal protein and fat. Studies carried out on healthy children two to ten years old suggest that when the caloric intake is ample, no improvement in the nitrogen balance is obtained by the daily administration of more than 2 gm. of mixed protein per kilogram of body weight. Information is included showing the yield of vegetable and fruit nutrients per acre and per 100 man hours of farm labor. The yield of animal nutrients per acre and per 100 man hours of farm labor are also stated. Arguments are presented favoring the mixed cereal-vegetable sources of proteins where economics must be considered. In regard to infant formulas, comparative costs of equicaloric cow's milk formulas and human milk are listed. It is concluded that when thrift is necessary, it is wasteful to feed babies by bottle or to provide more than minimum essential allotments of the animal-protein type of food for older children and adults.

THE NEW YORK STATE JOURNAL OF MEDICINE

Vol. 48, July 15, 1948

*The management of diabetes complicated by tuberculosis. M. Ant and R. A. Love.—p. 1613.

Vol. 48, August 15, 1948

*Some newer aspects of protein metabolism. D. Schwimmer and T. H. McGavack.—p. 1797.

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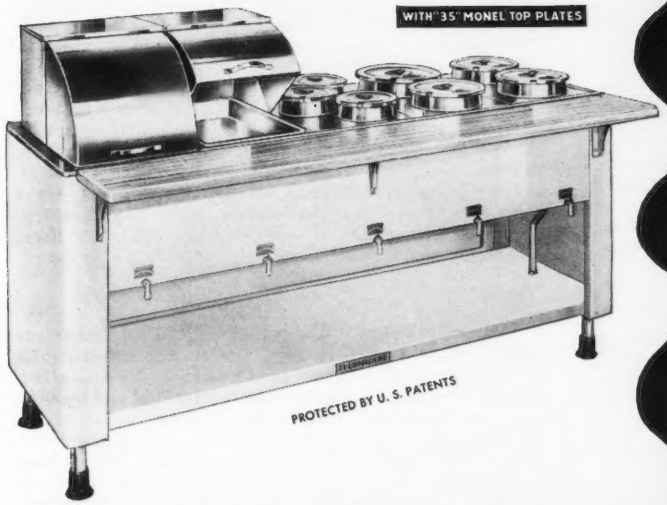

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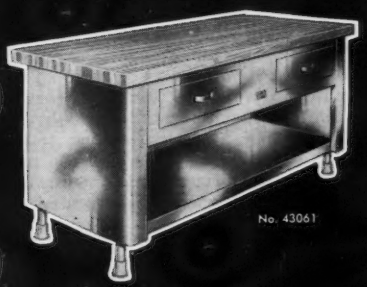
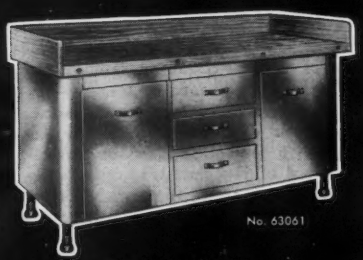
WORK TABLE
Base open on each long side.



COOK'S TABLE
Base open on operator's side only. Two stainless drawers, 19" x 20" x 5"



BAKER'S TABLE
Two stainless bins each have a capacity of 150 lbs. of flour. Steel bottom is tight fitting for sanitary purposes. Three stainless drawers, 19" x 20" x 5". 5" Guard on three sides of top.

Diabetes Complicated by Tuberculosis. Tuberculosis occurs four times more often in diabetic patients than in non-diabetics. Tuberculosis, because it may affect many glands and organs, interferes with normal sugar metabolism and thus becomes a factor in the causation of diabetes. If a diabetic condition is properly controlled, the condition of tuberculosis is improved. Protamin zinc insulin is considered to be contraindicated in diabetic individuals with tuberculosis.

Protein Metabolism. This is a resumé of experimental data and clinical application of the newer aspects of protein metabolism. The new knowledge of protein utilization enables us to prepare more adequately for surgery, to decrease fatality due to rapid depletion of the body's stores of protein in conditions of acute stress, and to improve the status of patients suffering from chronic debilitating illnesses, particularly those of an infectious nature. These objectives can be accomplished by bringing the intake of protein into adequate relation with its loss and by administration of certain hormones which regulate nitrogen metabolism.

NUTRITION REVIEWS

Vol. 6, September, 1948

*Nutrition in diabetes. K. Emerson, Jr.—p. 257.
*Bone rarefaction, hypoprothrombinemia, and hypervitaminosis A.—p. 261.
Malignant malnutrition in South Africa.—p. 270.
Hunger edema in children.—p. 279.

Nutrition in Diabetes. Part of this discussion is devoted to the subject of the control and amelioration of diabetes. Emphasizing that tolerance to glucose can be increased by adequate control of carbohydrate metabolism, the author points out that from the nutritional standpoint, it is helpful to divide diabetic patients into two groups, insulin sensitive and insulin insensitive. The reaction of these two groups to insulin and their requirements for carbohydrate are considered. In addition, attention is given to the principal complications of diabetes with which the nutritionist is concerned—vascular changes and the neuropathies. Here, the treatment for arteriosclerosis is presented. In this connection, mention is made of various methods of lowering serum and tissue cholesterol levels. Also discussed are: (a) factors relating to abnormal calcification; (b) the correlation between hypoalbuminemia and diabetic retinitis; (c) the demands of the body for phosphorus and potassium for normal oxidation of carbohydrate; and (d) the problem of primary diabetic neuritis.

Hypervitaminosis A. It has been demonstrated that although vitamin A is relatively nontoxic, administration of greatly excessive amounts is injurious, resulting in skeletal abnormalities, hemorrhage, and anemia. Experiments are cited in which the effects of hypervitaminosis A in rats were overcome with vitamin K. In other experiments, ascorbic acid exhibited protective action. The conflicting reports presented suggest that signs of toxicity may, instead of being evidences of hypervitaminosis A, be the result of an unknown toxic substance in the vitamin A preparations used. The studies summarized in this paper are important because they indicate valuable therapeutic measures in cases of accidental ingestion of excessive amounts of vitamin A, and because they furnish pertinent leads for further investigations.

SOUTHERN MEDICAL JOURNAL

Vol. 41, July, 1948

*Anemia of malignancy. A. J. Schwertman.—p. 598.

Anemia of Malignancy. Malignancy, occurring in any tissue, whether extensive or not, and with or without bone marrow involvement, is capable of producing an anemia. The exact mechanism of this anemia is not definitely known. Its causes may be due to any one or a combination of the following: (a) interference with ingestion or digestion of adequate foods; (b) absorption of hemolytic agents from ulcerating and infected surfaces, or from necrosing areas of closed tumors; (c) the production of some substance by the malignant process which inhibits the bone growth or utilizes a product in its growth necesary for production of red cells and hemoglobin; and (d) hemorrhage. Fifty-eight cases of carcinoma in eight different organs are presented. Anemia is more marked in those organs where hemorrhage, ulceration, and necrosis occur.

AMERICAN RESTAURANT MAGAZINE

Vol. 32, August, 1948

Air conditioning maintenance is simple. T. Trail.—p. 38.
The uniform style show of 1948.—p. 39.
*The service of a glass of water. J. B. O'Meara.—p. 44.
Make meat go all the way to save food costs. J. A. Cline.—p. 46.
*Future of the American restaurant. C. A. Patterson.—p. 48.
A novel layout pattern for a narrow lot. G. Zipfel.—p. 63.

A Glass of Water. Looking around restaurants, one wonders if people have heard customers' complaints about how water is served. The best way to take glasses to service stations is in wire baskets from the glass machine or up-side-down on trays. Watch for chipped or cracked glasses. Do not fill the glasses to overflowing. Never put fingers in the glasses to fill them with ice, but use a scoop or tongs. In serving water, never touch the top of the glass with the fingers, grasp it near the bottom. If water cannot be placed from the right, serve it with the left hand and reach across the middle of the table. The glass should be kept filled from the time it is on the table until the customer leaves. Water from a glass should never be used to clean an ash tray or a table top. Do not pick glasses up with the fingers on the inside of the glass of water and never carry more than four glasses at a time. Do not stack glasses together. Serving water is a good place to start better service in the restaurant.

Restaurant Future. Today there are 200,000 restaurants serving 50 million meals a day. One of the greatest strides in the restaurant business is the advance in sanitation. Waitress training is being stressed in all states, and training programs have been established. The realization of the need for modern, attractive restaurants with pleasant surroundings is needed now and in the future. The Rotary Club slogan, "He profits most who serves best," could well be adopted for the standard for the future of restaurants. Operators must keep in mind the value of food merchandising, as well as the value of efficient arrangement of kitchen equipment and serving stations. A better job should be done in employee relations. Restaurants of the future must save footsteps. Prepared foods may be used in restaurants to save time, labor, and food cost. Progressive restaurants have something few other businesses can boast—personality. Remember, "We grow as long as we are green."

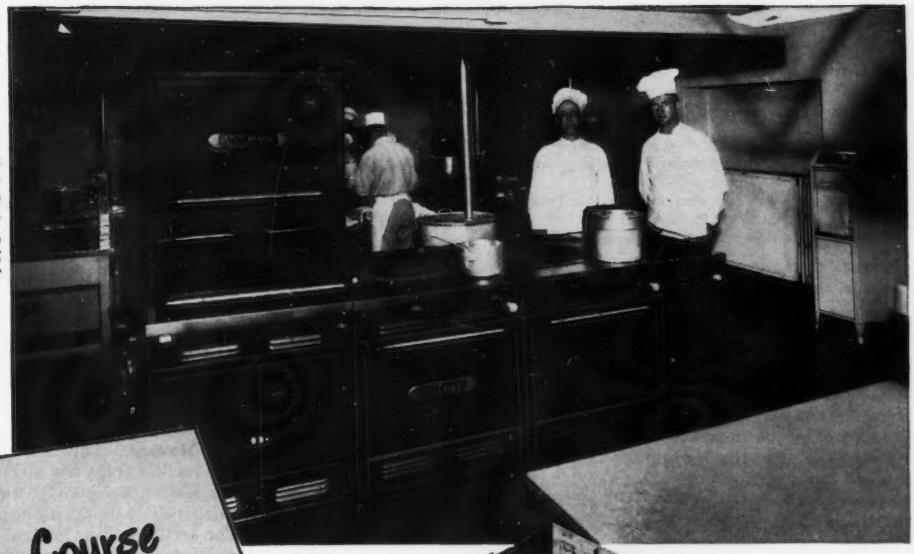
BAKERS' HELPER

Vol. 90, July 24, 1948

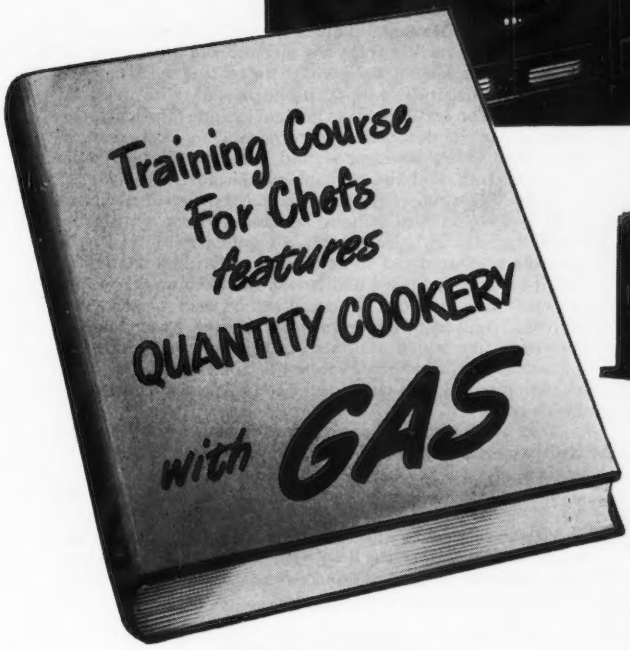
12-point program for a sanitary bakery. E. L. Holmes.—p. 49.

Vol. 90, August 7, 1948

*Speak to the people. R. Newcomb and M. Sammons.—p. 55.
Planning for profit. Advantages of a central weighing department. D. L. McIntyre.—p. 66.



Co-ordinating Chef William Bruschweiler, and Chef Instructor John Juker who conducts the daytime program. Chef H. J. Gearou, Chef Instructor of morning classes, is the third member of the teaching staff.



Miller Vocational High School, Minneapolis, which offers scientific training in quantity cookery as an important part of its curriculum.

"SCIENTIFIC TRAINING for the business of feeding the public"—that's the way Principal Raymond V. Nord of Miller Vocational High School describes the course in quantity cookery. Under joint sponsorship of Minneapolis and Minnesota Hotel and Restaurant Associations this Chef's course includes training in all phases of food preparation and service.

Practical restaurant operation is the first consideration in the program, and the training is conducted in conjunction with the teachers' cafeteria. Here, where future chefs are taught the latest techniques of quantity cookery, the work-shop is a modern GAS kitchen, equipped with radiant broiler, hot top ranges, deck oven, deep fat fryer. Here, the flexibility of GAS for every type of quantity cookery, simplifies the all-'round training program of cooking, baking, sanitation, menu planning, and food service.

GAS is a time-tested fuel for quantity cookery, and modern Gas Cooking Equipment is so easy to use and maintain that it's only natural to find it in the finest kitchens and in recognized schools for chefs, like the Miller Vocational Training School, Minneapolis.

In every commercial and institutional kitchen the automatic controllability, speed, and economy of GAS are important factors in modern quantity cookery.

You'll find it worthwhile to investigate the latest types of Gas Cooking and Water Heating Equipment.

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

Vol. 90, August 21, 1948

Rasmussen's Danish kitchen.—p. 48.
*Material costs and material control methods. L. G. Knight.—p. 61.
*Radar sandwiches: A natural for the "quick bite" trade.—p. 96.

Vol. 90, September 4, 1948

Selection, training and organization of supervisory personnel. C. Pickering.—p. 68.
*Bakers and the research and marketing act. P. Talbott.—p. 74.
Frozen baked products. W. E. Broeg.—p. 89.
Material costs and material control methods. L. G. Knight.—p. 95.

Speak to the People. Management is now beginning to wonder whether house organs shouldn't be building better employer-employee relations. The employee publication is the strongest potential link for management in the chain of employer-employee communications. Where management has made the link strong, the house organ is doing a job. Factors to be considered in the publication of one of these organs are: employee interest in the soundness and security of his job; increased employee interest in the operations of the company; awareness that people are basically picture minded, hence blocks of text haven't the readership acceptance that is found in pictures portraying the same information; media of communication are becoming important and centralized; employees now have an interest not only in the results or products of their own job but also in the end-products. Pointers for improving employee relations are: decide what you want your media of communication to accomplish; look for leaks in your management dike that need to be plugged; don't insist that you have an employee publication unless you need one; build the job first and the budget later; and put someone in charge of the program, preferably someone high enough in management to make decisions. This program may be adapted to the small as well as the large organization and an employee publication, at best, is only a substitute for personal contact.

Material Costs. This article is Part I of a two-part series on material costs and material control methods. Three types of costs are listed: overhead, labor, and material costs. Indirect labor costs affect material control costs, and these costs must be kept in balance. Recommendations of the Research Institute of America are given for attaining this balance in a simple and streamlined way. Suggestions on ways in which to cut material costs are given.

Radar Sandwiches. A radar sandwich has been developed. It is a cylindrical roll baked in a cylindrical pan, with a hole drilled in the roll which is stuffed with a precooked filling. It is wrapped in cellophane, sealed, and packed in boxes for delivery to the sales outlet. It can be heated or toasted either in patented heating equipment or in an oven. It has proved to be a good repeat seller wherever placed on the market. A radar pie is now being perfected to be sold hot by means of vending machines and electronic ranges. Small bars and grills, ball parks, race tracks, and trains, planes, and busses are particularly interested in these products.

Research and Marketing Act. Under the Research and Marketing Act, 1946, a project was initiated to study the causes of "staling" and flavor deterioration in bakery products. It was started in January, 1948, by the American Institute of Baking, a nonprofit, noncompetitive scientific institution in Chicago, under contract with the U. S. Department of Agriculture. The first contract made under the research project deals with bread and rolls, but is expected to yield information concerning other yeast-raised products. Later, chemically leavened products may be investigated. In another project, new methods and official standards for measuring the bread-baking quality of wheat will be sought. Contracts for the work have been let to several firms. Department grain specialists point out that bread-baking quality should be one of the principal factors in determining the grade and classes of wheat used for bread purposes. Present official grain standards do not fully meet this requirement. An outline for the next series of bakery product studies which will be recommended has been developed by the Baking Industry Research Advisory Council; it calls for an investigation of the effect of every ingredient and chemical that bakers use in processing bread and rolls, as well as further studies of fermentation, make-up methods, proofing, baking, cooling, wrapping, and slicing, and distribution. The entire study might take three years to complete.

BUILDINGS

Vol. 48, August, 1948

Building materials.—p. 12.
*A practical decorating manual for building managers.—p. 39.

Vol. 48, September, 1948

*Better office lighting.—p. 12.
*Wax remover.—p. 12.

Decorating Manual. This is a quick "check-reference" handbook that will refresh the memories of old timers and give new managers a welcome lift in getting their money's worth from decorating dollars in the present rapidly shifting market. The sections of the manual include information on what's new in decorating, how decorating costs can be cut, what every manager should know about techniques in decorating, and the psychology of color.

Office Lighting. Originally intended for residential use, a new glass-shielded, single, fluorescent lamp fixture has been found highly adaptable to commercial use. The lamps are constructed to be used as individual fixtures in small areas or mounted end-to-end in continuous rows for general space lighting. The unit can be used for perimeter lighting; right angle bends are made possible by attaching a curved fitting which allows an unbroken row of lights to be mounted around the contours of the room. The glass shield on one side of the fixtures can be easily removed for quick servicing.

Wax Remover. A powerful new cleaner for removing badly soiled self-polishing wax and ground-in dirt from the surface of all floors has been developed. One gal. of this new maintenance product is sufficient for cleaning 20,000 sq. ft. of floor. Maximum results are obtained by mixing it with twenty parts water. The cleaner is mixed with hot water and applied to the floor with a mop, cloth, or sprinkling can, and after a few minutes the softened wax and dirt is washed away with clear water.

CHAIN STORE AGE

Vol. 24, August, 1948

*Building top personnel. B. E. Lewis.—p. 23.

Vol. 24, September, 1948

*Developing a plan for salary administration. H. W. Burgher.—p. 14.
Maintaining lighting equipment. W. von der Ahe.—p. 26.
Reducing window reflection. B. Foreman.—p. 28.

Personnel. Hot Shoppes, Inc., Washington, D. C., have adopted the multiple management plan with a great degree of success. They have a Junior Board of Executives which is self-selective in its membership and chosen to insure rotation of its members. This board is responsible for the formulation of effective recommendations to improve the operation of the business. All recommendations must be unanimously agreed upon before they can be submitted to the Senior Board for action. Hot Shoppes, Inc., believe that through their multiple management plan they are bringing rank-and-file and top management ever closer in cooperatively striving for the best interests of the restaurant chain. At the same time, they are creating a reservoir of executive ability for use in the future.

Salary Administration. Salary administration plans are not created overnight, but are developed around an existing

New facts about Amino Acids show why Quaker Oats is a nutritionally superior cereal...

IT has been difficult to explain entirely, the recognized nutritional superiority of rolled oats. But now, with the development of techniques for quantitatively determining the amounts of individual amino acids, some of this difficulty has been removed.

The value of a protein is measured not alone by the quantitative amounts of amino acids available for absorption, but also by the relative amounts of one amino acid in respect to another. This is particularly true of the eight indispensable amino acids.

In utilizing protein, an animal organism metabolizes individual amino acids in certain reasonably fixed ratios. For example, if the absolute amount of tryptophane needed by the organism is low, this deficiency cannot be remedied with an excess of any other amino acid.

This is just another way of saying that a chain is no stronger than its weakest link ... that a protein is no better than the value of the amino acid in most limited supply.

It is common knowledge that oatmeal has the highest amount of protein of any cereal . . . but an equally important fact is that the protein of Quaker Oats has exceptionally favorable balance between the individual amino acids.

This is another reason why Quaker Oats is a nutritionally superior cereal . . . an additional reason why you will be wise in serving it often.

QUAKER OATS

THE GIANT OF THE CEREALS

Quaker and Mother's Oats are the same

situation within an organization. A sound plan includes job evaluations with all its ramifications and establishes comparable wages within the organization and with similar jobs in other companies. The Rexall Company of Los Angeles has set up plans whereby employees available for promotion to the next job may be selected from charts and performance reviews. No department expands or shrinks its staff without the salary administration committee being informed of the change. The cost of labor, which includes the fringe benefits, can now be calculated. Happier groups of workers show increases in production, and labor turnover, with its resultant increase in cost, is decreased. To organize, develop, and install a salary administration plan with its job evaluation component, the services of a trained indivudal are needed. It is most important that all levels of supervision and all employees be kept informed of the progress of the plan. A job evaluation program calls for the development, by job analysts, of descriptions of the jobs within the program. After this, the jobs are rated factor by factor, by point value, and divided into dollar scales to rank with the point value scale. Dollar range charts and rate increase charts are developed. Sample charts and graphs are shown. Job evaluation programs are the basis for the salary administration plan.

THE HOTEL MONTHLY

Vol. 56, August, 1948

*Five steps to institutional food buying. A. A. Frooman.—p. 40.
How giant food business of a modern college is handled.—p. 44.

Food Buying. In this fourth article of the series of five, the author presents more suggestions for preparing practical food buying procedures for both small and large operations. Simplicity with absolute buying authority and responsibility is the basis of sound food buying programs. In selecting articles to be purchased, a draft of specifications should be made to cover each item. Purveyors and their representatives can be of great service here by providing commercial descriptions. Before adopting a course of buying, established sources of supply should be consulted and current and future market trends determined. All deliveries should be carefully inspected upon receipt. A simple but efficient method of inventory control should be installed. Although not especially applicable to private enterprise, it is well for all institutional food buyers to become familiar with all major restrictions surrounding the federal government's purchasing structure which constitute the essential difference between governmental and private procurement. The major restrictions in government purchasing procedures are outlined.

THE NATION'S SCHOOLS

Vol. 42, July, 1948

Gymnasium and cafeteria under one roof. L. A. Steger.—p. 34.
*Lunchroom at Northeast High. R. Heckler.—p. 37.
This cafeteria has fountain room. H. R. Lake.—p. 38.
*Merits of self-chosen and "type A" lunches. J. E. Elwell and M. S. Reynolds.—p. 56.
Puerto Rico's school lunch program. M. Kinlan.—p. 57.

Vol. 42, August, 1948

*Make better use of the midday break. R. B. Norris.—p. 56.
School lunch managers meet.—p. 58.

Cafeteria Layout. The cafeteria for the Northeast Junior-Senior High School at Oklahoma City is a one-story structure adjacent to the gymnasium. It is planned to accommodate 1200, but the average number served daily will be 900; this will be accomplished by three servings at 25-min. intervals. The dining room area occupies 5076 sq. ft.; the food preparation area, dishwashing unit, storeroom, and dressing room occupy 2160 sq. ft. The faculty dining room occupies 400 sq. ft. Some of the advantages of the layout are: The faculty dining room may be closed off when not in use. The student serving area may be shut off from the dining room. Sections of the tray rails are removable. The kitchen is planned to eliminate cross traffic. The refrigerator is equipped with a frozen food cabinet. Steam cookers and steam-jacketed kettles are placed in a depression of the floor, each having a separate drain. The space for garbage cans is cemented and enclosed. Hot water and drain connections allow for washing the cans.

Merit of Self-Chosen Lunches. A study made in a suburban Detroit school to determine the advantages of a self-chosen meal over the Type A lunch in school cafeterias showed that the Type A lunch has definite advantages over the self-chosen à la carte meals. The study was done for seven consecutive days with the children of the fourth, fifth, seventh, and high school grades. Only 20.8 per cent of the self-chosen meals were rated as good, while 68.1 per cent of the Type A meals were rated as good. One of the most definite increases in consumption brought about by the Type A meal was in the case of vegetables. There was also an increase in milk consumption. Further study must be made and the following questions considered: (a) Does a child learn to choose a well-balanced meal as a result of having no choice in selection? (b) Does an à la crate service provide opportunity for practice of academic knowledge of nutrition? (c) Will the child actually eat all of the Type A meal served to him? (d) How well will the Type A lunch be accepted by those used to choosing their own lunch? (e) Is the child apt to resort to lunchrooms or fountains if he is allowed to leave the school grounds during the lunch period?

Worthwhile Mid-Day Break? Today the educational potentialities of the noon-time meal should be reconsidered, for this portion of the school program deserves as careful consideration by the administrator as does any other part of the schedule. It should furnish the student with an adequate meal to be eaten properly, provide a health teaching situation, develop student leadership and civic responsibility, and aid students in the evaluation and use of leisure time. If students and teachers must eat in shifts, the recreation period can be fitted into the situation. Facilities for hand-washing should be available and time allowed for the use of them. Plate lunches are a wise way to introduce pupils to a nourishing meal. Business can be taught through many experiences in the cafeteria and dining room so that the student can learn and practice civic responsibilities. The mid-day break is a good place to instruct students in better use of leisure time. Students should be gently guided into activities, and this can probably be best accomplished by the use of student committees. The program should be voluntary.

PERSONNEL JOURNAL

Vol. 27, July–August, 1948

*Communication and training—the tools of supervisory development. W. J. Eisenberg and C. G. Donerly.—p. 87.
II. The field review method of employee evaluation and internal placement. G. W. Wadsworth, Jr.—p. 99.
*Teaching personnel administration by role playing. H. Wolozin.—p. 107.

Vol. 27, September, 1948

III. The field review method of employee evaluation and internal placement. G. W. Wadsworth.—p. 135.
*Discipline—a supervisor's confession of failure? R. Walls.—p. 142.

Supervisory Development. Management has not fully realized that because the first-line supervisor interprets management to the worker, he exercises the greatest single

Yours Now —in the line of the leader!

Now you can get more—still more—for your investment in commercial cooking equipment. Every unit is complete with many advanced improvements exclusive with Garland. Every unit aligned and co-designed to match every other.

Select the units you need now. Arrange them to fit your kitchen plan. Add more as needed.

Have harmony, good organization and peak efficiency with units designed to work together in all food preparation jobs.

All Garland units are available in stainless steel and equipped for use with manufactured, natural or L-P gases. See your nearest dealer or write us.

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influence on employee morale. If management is to project authority through all layers of supervision to the first-line level, five objectives must be continuously maintained: (a) Effective lines of communication must be established. (b) Uniform interpretation of directives, memoranda, and statements of policy must be assured. (c) Supervisors must be properly motivated. (d) The quality of supervisory practices must be improved. (e) Supervisors must have a common understanding of goals, objectives, duties, and language. Constructive action in these five areas can be accomplished by instituting a continuous program of supervisory development conferences. These conferences and their advantages are discussed in detail.

Teaching Personnel Administration. Practice in the art of understanding human relations within an organization was given students in a personnel administration course at New York University. The class was divided into ten groups of six students each, selected to avoid including friends in the same group. Thus the framework was established for adjusting to a strange group. Each group selected a research project in personnel administration, and each member was given a part of the project on which to work. However, the most fruitful innovation of the training program was group participation in analyzing and interpreting case histories. More than a mere variant of the case method of study was developed; it was the linking of "role playing" to the actual case history. One member of the class acted as personnel administrator during the discussion, and the rest acted as staff. From this experiment, unknown leadership abilities were displayed as well as enthusiasm at being able to do "original thinking" instead of repeating textbooks.

Discipline. This thought-provoking article points up the importance of the attitude of the supervisor if employee morale and efficiency is to be what it should. Many supervisors and executives obtained their formal training during a period when the philosophy was to deal with business and business relationships on a purely economic basis. However, it has been proved that the economic factor is only one factor and that members of an organization are in a social organization as well. Problem employees as well as problem supervisors create circumstances which may lead to disciplinary action. The author gives descriptions of several types of employers and supervisors who seem to generate systems requiring discipline; he also mentions types of employees who are frequently involved in disciplinary situations. Special stress is placed on the fact that the philosophy of the management group, their social skills, and understanding determine to a large extent the cooperation that can be expected from the employees.

RESTAURANT MANAGEMENT

Vol. 63, July, 1948

How a typical American built his success on steaks and chickens. W. O. Voegele.—p. 29.

*Let's look at the record. Combined operations and expenses. W. O. Voegele.—p. 34.

*How the architect converts ideas into profits. H. E. Werner.—p. 38.

*What's new. L. Adams.—p. 74.

Vol. 63, August, 1948

*The seven "Ss" of sound personnel training. A. H. Clawson.—p. 33.

*Making maximum use of every inch of kitchen and service space. C. D. Wells.—p. 36.

Selling salads, sandwiches and cold plates to lagging summer appetites. A Easton.—p. 40.

Records. The financial picture, accounting procedures, operating statements, and control and insurance records of a chain of restaurants in Southern California are described. The records kept by each restaurant are: cash receipts journal, sales journal, cash disbursements-voucher register journal, payroll records, monthly general journal, and the general journal. The various records and their use are discussed, and a chart shows the cost of sales to be 43.7 per cent; the payroll, 31.0 per cent; operating expenses, 10.3 per cent; maintenance, 1.4 per cent; profit before administrative salaries, depreciation, corporate, and property taxes, 7.4 per cent.

Architects in the Restaurant Field. The architectural profession is made up of specialists who are trained in the fundamentals of design, engineering, knowledge of materials, building codes, color harmony, and other building aspects. A large group of architects have chosen the restaurant field for specialized work. The responsibilities of the architect who is called in on a food service project are discussed.

What's New. A small battery-powered appliance has been developed for detarnishing silver by removing the sulphur, turning the silver itself back into original silver. Tarnish is removed from both sterling and plated ware by touching the tip of the appliance to the silver while it is submerged in a pan of slightly salted water. The battery that is included lasts about one year.

Personnel Training. Personnel management is the job of managing people in the best sense of the word. By the use of the following four tools, a sound program may be built: (a) proper delegation of authority, (b) unity of command, (c) the appointment of capable sub-directors, and (d) the grouping of assignments according to similar jobs and skills. These tools and their applications are considered in detail. Some tangible returns of the training program which are pointed out are: decreased turnover, higher employee morale, greater profits, decreased maintenance costs, and more satisfied guests.

Maximum Use of Kitchen and Serving Space. The restaurants at Chicago's Municipal Airport consist of the Cloud Room for leisurely dining; the Coffee Shop for quick service; and two snack bars. These concessions are run by the Marshall Field & Company. The installations are run on a scientific factory method which is applied to all phases of the unit; the kitchen is divided into miniature production lines. Small steam pans in the counters make constant cookery of foods necessary; if the demand for an item is very heavy, the food is prepared ahead and held in thermostatically controlled cupboard-like boxes. Preliminary food preparation is done in the basement. Much of the meat is purchased in individual portions, but some meat cutting is done by the butcher. Frosted fruits and vegetables are used almost entirely in order to save preparation area; frequently they freeze their own foods during slack periods of business. All jobs are rated and graded by experts, and all are subjected to time studies. The kitchen is directed by nine graduate dietitians who plan the meals and do the buying and supervision of the kitchen. All recipes are according to the Field's policy of "formula" meal planning and pricing and do not vary. The dining room is supervised by nine hostesses; the waitresses are sent to the waitress school for six weeks of training.

WHAT'S NEW IN HOME ECONOMICS

Vol. 12, August, 1948

A night school on the Greek island of Zante. F. B. Floore.—p. 5.

The lunchroom manager talks to a mothers' club and about the child and nutrition. W. S. Pendergast.—p. 8.

*Featuring home economics through radio. J. T. Wagner.—p. 10.

Vol. 13, September, 1948

Spotlight on teaching nutrition.—p. 59.

Studying the electric range in a university laboratory.—p. 70.

*Home economics careers in the making. I. S. Willson.—p. 178.

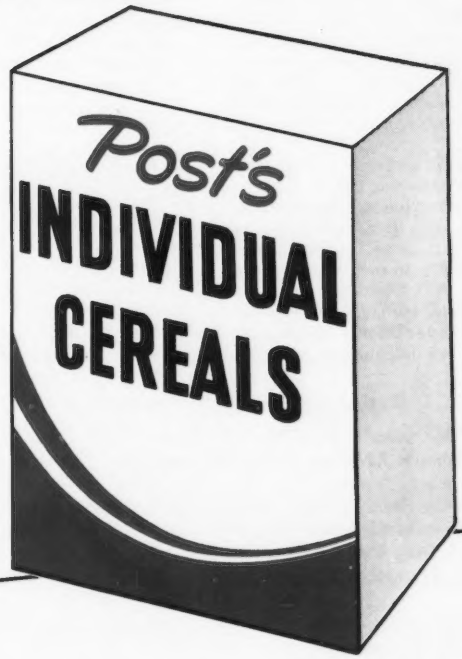
*Better trained workers for school lunch programs. M. M. Morris.—p. 202.

Home Economics Through Radio. Radio is a field which home economics has not explored as fully as possible. The

"Saving Money," SAY DIETITIANS IS BIG ADVANTAGE OF POST'S CEREALS

Post's Cereals are truly thrifty!

They're fresh and nourishing, too!



And don't forget they offer variety!

...PLUS... a bonus in premium coupons!

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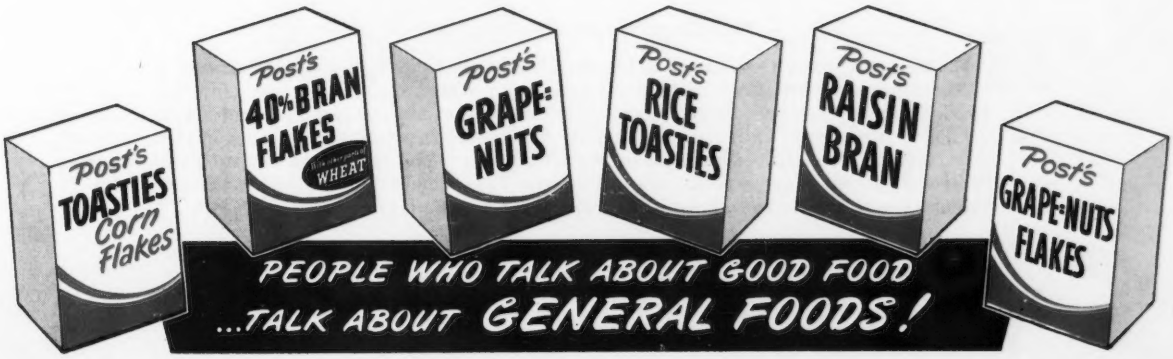

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...TALK ABOUT GENERAL FOODS!

entrance of more home economists into the radio field would be equally advantageous to both fields. The radio staffs do not realize the abilities of the home economists, and the home economists do not realize the possibilities of radio, do not exhibit the imagination that radio demands, and are often too infatuated with home economics techniques. Skills a home economist must acquire to go into the radio field are: self-expression in writing and in dramatics; a good speaking voice for those who broadcast; an "iron" constitution; an extrovert type of personality; and calmness when faced with insecurity and erratic schedules. Contributions which a home economist may make include food programs and educational programs in many fields. A home economist must broaden the base of her education and keep in constant contact with the current flow of events and interpret this knowledge for the home. Jobs in writing, directing, or broadcasting are available, but it is a big job and not an easy one.

Career in Dietetics. This month's career article tells the story of Peggy June Crooke, a senior at the University of Texas, who is majoring in institution administration. An interesting account is included as to how she decided on her career. Miss Crooke plans to take an internship approved by the A.D.A. and eventually to own her own tea room.

Workers for School Lunch. Many managers and cooks in the school lunch program do not have the information and skills needed to perform their work adequately. School lunch workshops held during the summer were profitable, but most of them were for persons holding degrees in home economics; they were on the supervisory level. Of equal importance are the short courses and institutes for women without professional training who buy, prepare, and serve the food in school lunchrooms. School administrators have found that women who are interested in children and who are usually homemakers make a better adjustment to the school situation than persons with experience in commercial eating places. They must grasp the spirit of the program. Where central purchasing by a trained person is not the practice, they need to be taught how to plan in advance and get the best returns for the money spent. They need training in menu planning, and they need training in the techniques used for preparing food in large quantities. Sanitation requires continual emphasis. The ways of maintaining mental and physical health should be discussed. The women, ideally, should be given an orientation course just before school opens in the fall, and then later attend monthly group meetings. On-the-job training would be given as needed. Training must be realistic, practical, and timely. Training should be given as part of the day for which the worker is paid. Monetary reward should be given for workers who satisfactorily complete training courses with accredited institutions during the summer months. Before such a training program can be completed, adequately trained supervisory personnel must be obtained.

Beta Carotene from Sweet Potatoes

In the August, 1948, issue of *Industrial and Engineering Chemistry*, W. C. Sherman and C. J. Koehn of the Alabama Agricultural Experiment Station, Auburn, report a method for extracting almost pure beta carotene from Porto Rico sweet potatoes. Because the pigment of these sweet potatoes is predominantly beta carotene, the method described involved only a few operations and is adaptable for commercial use. The beta carotene obtained after only one recrystallization from sweet potato oil and no chromatographic separations is approximately 97 per cent as pure as the purest preparation of beta carotene made by Zscheile *et al.* from carrot roots.

The high degree of purity of the beta carotene obtained by this new procedure makes it desirable for use in enriching food with vitamin A activity for human consumption, especially butter produced during the winter and margarine. These foods are at present colored with coal tar dyes or annatto extract that do not have vitamin A activity. Butter made in the winter from milk contains much less vitamin A activity because of the lack of carotene in the feed. If beta carotene, the natural pigment in butter, were used to color winter butter, it would be possible to restore the vitamin A content to nearly the summer level. It is pointed out, however, that the present cost of pure beta carotene makes this impractical.

The beta carotene obtained by the method described by these workers would also be adaptable for use in laboratories engaged in nutritional or biochemical research or control work, for it is of sufficient purity for use as a spectrophotometric, colorimetric, or biological standard.

With this method, it does not seem to be commercially feasible to attempt to recover all of the beta carotene from the sweet potato oil. Thus, after as much as will crystallize out without saponification has been removed, the sweet potato oil still contains over 10,000 I. U. of vitamin A activity per gram. This is much more than commercial cod-liver oil contains, and this remaining oil should find a ready market as a vitamin A-rich supplement for animal feeds.

New Formula for Enriched Bread

The New York State Department of Health, in an effort to provide additional nutrients in which institutional diets may be deficient, has developed a new formula for a more nutritious bread. The new formula is simple, practical, and inexpensive, and includes 6 per cent full-fat soy flour and 8 per cent fat-free dry milk solids. The formula has been tested in two institutions, one with somewhat old-fashioned bakery equipment and the other with a modern plant. Satisfactory results as far as production was concerned were obtained in both places. Similar formulas have been developed in Great Britain.—*From New York Times, July 25, 1948.*

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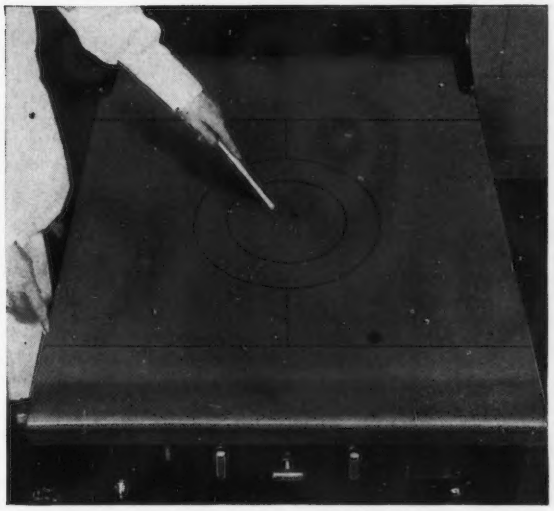

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News Notes

A.D.A. Officers and Executive Board for 1948–49. On October 22, at the Annual Banquet of the American Dietetic Association, held at the Hotel Statler, Boston, the outgoing officers and section chairmen of the Association turned over the administration to a new group. Members of the 1948–49 Executive Board, which includes elected officers and appointed section chairmen, are:

President: Helen E. Walsh, Supervising Nutritionist, California State Department of Public Health, San Francisco.

President-Elect: Elizabeth Perry, Chief Dietitian and Assistant Superintendent, City Hospital of Cleveland.

Vice-President: Grace Bulman, Chief, Dietetic Division, Department of Medicine and Surgery, Veterans Administration, Washington, D. C.

Secretary: Margaret A. Ohlson, Professor and Head, Department of Foods and Nutrition, Michigan State College, East Lansing.

Treasurer: Fern W. Gleiser, Professor of Institution Economics and Management, University of Chicago.

Chairman, Professional Education Section: Dr. Ercel S. Eppright, Head, Food and Nutrition Department, Iowa State College, Ames.

Chairman, Diet Therapy Section: Marguerite Pettee, Chief Nutritionist, Medical College of Virginia, Richmond.

Chairman, Food Administration Section: Marion D. Floyd, Director of Dietetics, Massachusetts General Hospital, Boston.

Chairman, Community Nutrition Section: Adelia Beeuwkes, Assistant Professor of Public Health Nutrition, School of Public Health, University of Michigan, Ann Arbor.

Dr. Ruth Wheeler. Too late for inclusion in the October issue, word was received in the JOURNAL office of the passing of Dr. Ruth Wheeler on September 29 in Poughkeepsie, New York. Dr. Wheeler was one of the early leaders and pioneers in the field of dietetics, having been active in the development of the American Dietetic Association and serving as its President from 1924 to 1926. She had been Professor of Physiology and Nutrition, Vassar College, Poughkeepsie, from 1926 until her retirement in 1944.

Career Management Plan for Army Dietitians. A career pattern has been developed for officers in the sections of the Women's Medical Specialist Corps in the Regular Army. According to Colonel Emma E. Vogel, Chief of the Corps, the implementation of this program marks another milestone in the development of this Corps and places it on the same plane with other corps in the Medical Department.

Upon entering the military service, all officers in the WMSC will be originally appointed in the Officer's Reserve Corps and will attend the Basic Medical Department Female Officers Course of two months at Brooke Army Medical Center, Ft. Sam Houston, Texas. Upon completion of this training, which will orient these officers to military life, they will be assigned to station and general hospitals for general experience. Specialization will not begin until the officer has accepted a commission in the Regular Army and has satisfactorily completed several years of military service.

The assignment of officers will be made on a planned, rotating, progressive pattern through station and general hospitals in accordance with demonstration of increased ability and acceptance of responsibility.

After four or five years of service, officers who have demonstrated outstanding ability may apply for training in civilian institutions to pursue graduate courses leading to a master's degree in the specialty concerned or in an allied field.

The following officers of the Dietetic Section, WMSC, who are members of the Regular Army, are now attending approved graduate courses: (a) Capt. Elsie K. Miller, Advanced Dietetics, Nutrition, and Diet Therapy, University of Wisconsin, Madison; (b) Capt. Katherine E. Manchester, Management and Personnel Administration, Cornell University, Ithaca, New York; and (c) Major Helen M. Davis, Advanced Institution Management and Personnel Management, Columbia University, New York City.

As this program develops, it is anticipated that similar graduate training in other civilian institutions will be approved. Participation in this program will maintain the standards of the WMSC on a professional level equal to and in many cases far in advance of standards maintained in civilian fields. Participation in this program will also enable each section to develop a group of leaders in these specialties and to establish a nucleus of highly trained officers capable of assuming additional responsibility in the event of a national emergency.

A full description of this career pattern is included in a new technical manual of the Department of the Army, titled *Career Management for Army Officers.*

Army Extension Courses for WMSC. A Department of Extension Courses has been established at the Medical Field Service School, Brooke Army Medical Center, Ft. Sam Houston, Texas, for the purpose of administering extension courses for officers in the Organized Reserve Corps, National Guard, and Regular Army. The primary purpose of the Medical Department Extension Course Program is to offer non-resident instruction to interested individuals. Every effort is being made to present material which will be of value to the members of the various corps of the Medical Department. Department of the Army Pamphlet No. 20–100, "Announcement of Army Extension Courses," dated July, 1948, contains the current list of subcourses proposed for Medical Department personnel.

Reserve dietitians, physical therapists, and occupational therapists in the Women's Medical Specialist Corps who are not serving on extended active duty are urged to avail themselves of the opportunity to participate in these courses which offer a wide variety of military subjects.

Requests for application blanks and informational material regarding extension courses should be submitted through the local Organized Reserve Corps Instructor to the Department of Extension Courses, Medical Field Service School, Ft. Sam Houston, Texas. Regular Army officers may request this material through established military channels.

New Section Chiefs for WMSC. The Surgeon General of the Army has announced the promotions of Major Eleanor L. Mitchell (Dietitian), Major Edna Lura (Physical Therapist), and Captain Ruth A. Robinson (Occupational Therapist), all officers of the WMSC, to the temporary grade of Lieutenant Colonel effective August 26, 1948. These officers, all of whom have had extensive professional experience and are considered to be leaders in their professions, were appointed as Assistants to Colonel Emma E. Vogel, Chief of the Women's Medical Specialist Corps, and as Chiefs of the Dietitian, Physical Therapist, and Occupational Therapist Sections of that Corps, respectively.

Lt. Col. Mitchell, the new Chief of the Dietitian Section, graduated from Battle Creek College, in Battle Creek, Michigan, with a major in dietetics in 1926. She took her dietetic training at Walter Reed General Hospital, Washington, D. C., in 1927. Her continous service in the Medical Department since that date includes several assignments in general and large station hospitals, two tours of duty overseas, and a previous tour of duty in the Dietetic Section in the Office of the Surgeon General from 1943 to 1945. In her recent overseas experience, Colonel Mitchell served with the Army of Occupation in the Far East Command where she established the position of Supervising Dietitian in the Office of the Surgeon in that Headquarters. Since her return to the United States, Colonel Mitchell has served at Army and Navy General Hospital, Hot Springs, Arkansas, and as Acting Chief, Dietitian Section, Office of the Surgeon General, Washington.

Lt. Col. Lura, new Chief of the Physical Therapist Section, graduated from Iowa State Teachers College in 1926 and from the training course in physical therapy conducted by the Medical Department of the Army at Walter Reed General Hospital, Washington, in 1930. She has had continuous service in the Medical Department since that time.

Lt. Col. Robinson, Chief of the Occupational Therapist Section, is a graduate of the Katherine Gibbs Secretarial School, New York City, in 1930 and from the Boston School of Occupational Therapy in 1939. She has served in the Medical Department since 1944.

WMSC Recruiting Booklet. "Let's Take a Look at Your Future With The Women's Medical Specialist Corp," is the title of a new recruiting pamphlet which gives information about the opportunities offered to women in the WMSC. Salaries, promotions, educational repuirements, and pictures of typical training centers, bases, and off-duty recreational and educational facilities and other information describe life in the WMSC. Each group —physical therapists, occupational therapists, and dietitians—is treated separately in this cleverly designed, 3½ by 8½ in. booklet.

Colonel Julia Stimson. In Poughkeepsie, New York, on October 1, Colonel Julia Stimson, Superintendent of the U. S. Army Nurse Corps from 1919 to 1937, died. She served as Chief Nurse of the American Red Cross in France in World War I and was known by many of that war's dietitians who served overseas. For her service in France, she received the Distinguished Service Medal, as well as a number of decorations from foreign governments. She was the first woman to receive the rank of Major in the U. S. Army, and following her retirement in 1937, was promoted to Colonel. In 1942 she was recalled to active duty and was assigned to recruiting more nurses for the service. She had been President of the American Nurses' Association from 1938 to 1944, and from 1940 to 1942 she served as Chairman of the Nursing Council on National Defense.

VA Dietetic Interns Graduate. Graduation ceremonies for seventeen dietetic interns were held at *Los Angeles Veterans Administration Center* on August 19.

The theme of the day was the "Covered Wagon" since this year marks the centennial of the advent of the covered wagons and the era they represented to California. The programs of the graduation exercises were in the shape of covered wagons, and the graduates were presented with covered wagons of wood, the names of their class being burned in script on the back.

The class was presented by Gertrude Miller, Instructor in Dietetics, who gave an interesting historical background of the covered wagon days of this section of the country which made the cross-country trek of those pioneers so remarkable. Following a short address by Dr. Charles F. Bayer, Assistant Manager of the Center, Marjorie N. Petersen, Chief, Dietetic Service, capped the members of the class while Dr. M. E. Hubbard, Chief Medical Officer, presented diplomas.

Members of the graduation class were: Wetona Alder, Utah State Agricultural College; Evelyn Leone Brown, University of Washington; Marion Fay Carter, Marygrove College, Detroit; Gertrude Alice Cooke, University of California at Los Angeles; Alberta Patricia Etchells, University of Washington; Gloria Ann Gannaway, Oklahoma A. & M.; Loretta M. Golino University of California at Los Angeles; Arlene K. Huegelmeyer, Queens College, New York; Huela Winifred Irion, Arizona State College; Dorthy Louise Jett, Rhode Island State College and Tuskegee Institute; Evelyn Beryle Lyon, Colorado A. & M.; Martha R. McCann, Marygrove College; Helen Christine O'Brien, Kansas State College; Ardyce Louise Rundquist, University of Nebraska; Shirley M. Shipman, Colorado A. & M.; Betty Jean Aker Speer, University of Arizona; and Evelyn Harris Ward, University of Tennessee.

Following the ceremonies, the members of the Dietetic Service were hostesses at a tea honoring the graduates, their parents and friends.

At *Kennedy Veterans Administration Hospital*, Memphis, the nine members of the first class of dietetic interns completed their training on September 10.

Maniza Moore, Chief, Dietetic Division in Branch Office No. 5, Atlanta, and Clara Childress, Chief, Education Section, Dietetic Division, Central Office, Washington, were guests.

The graduates were: D. Pauline Anderson, Iowa State College; Barbara E. Bartlett, Georgia State College for Women; Maude E. Harrod, Georgia State College for Women; Comer Hymes, Georgia State College for Women; Rubye Jones, University of Arkansas; Marion W. Love, University of Missouri; Mary O. Pitt, Florida State University; Anna L. Preston, University of Tennessee; and Margaret I. Ratcliff, University of Arkansas.

Other Graduations. Dietetic interns who completed their year of postgraduate training on July 31 at the *University of Kansas Medical Center* were: Faye I. Hayes, Mary Margaret Fennesy, Dorothy Hopkins, and JoAnn Jorden. They had been supplementing their work in the hospital by field trips to various Kansas City companies. Among those visited during the year were: Allvine's Dairy; Ark Bakery; Greenwood's Inc.; T. M. James and Son's China Company; Alfred Benjamin Clinic; Fred Harvey's food production unit at Union Station; Swift & Company; Mid-Central Meat & Supply Co.; the city market; and the Veterans Administration Hospital in Wadsworth, Kansas.

June 5 was the graduation banquet for the dietetic interns at *St. Anthony Hospital, Oklahoma City.* The interns honored were Sister Mary Leonard, St. Augustine, Florida; Sister Mary Devota, Chicago; and Mary Catherine Guiney, Tucson, Arizona. Sister M. Mechtildas, Superindendent of the hospital, presented the diplomas, and Sister Mary Margaret, presented the class pins to the graduating interns.

Dietetic interns at *The University Hospitals*, Oklahoma City, were the honored guests on May 19 at a buffet-style dinner. Because all of the interns do not graduate at one time, an annual banquet is held once a year to honor all of that year's interns. Each intern at this year's banquet was presented with a corsage. Short talks were given by members of the hospital medical and administrative staffs.

Frances Stern Memorial Service. On October 17, a memorial service for Frances Stern, founder of the Frances Stern Food Clinic of the Boston Dispensary, was held at the Hotel Statler, Boston, as part of the 31st Annual Meeting of the American Dietetic Association. At the service an oil painting of Miss Stern, who passed away last December, was unveiled.

Lois Latimer. Word has come of the death of Lois Virginia Latimer on August 12. Miss Latimer had been a member of A.D.A. since 1930 and was a member of the staff at Lawrence and Memorial Associated Hospitals, New London, Connecticut.

Myrtle Heath. The A.D.A. office has received word of the passing of Myrtle Heath on May 3. She was Head of the Dietary Department, St. Luke's Hospital, Bethlehem, Pennsylvania, from 1930 to 1938, and was dietitian at Columbia Bible College, Columbia, South Carolina, from 1939 to 1947, when she left her position to do graduate work at Columbia University, New York City. Miss Heath had served two terms as Treasurer of the South Carolina Dietetic Association.

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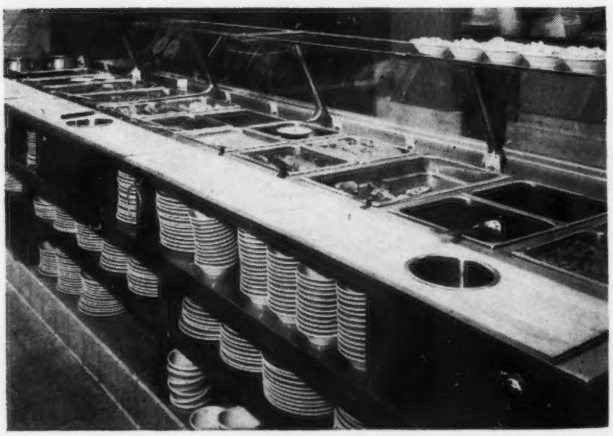

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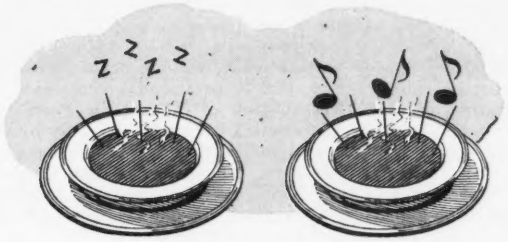

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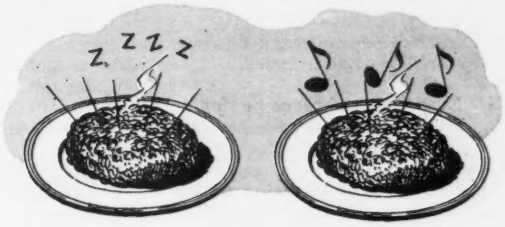

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FAO and WHO to Cooperate. Plans for a joint attack on the closely related problems of disease and food shortage are being made by two agencies of the United Nations—the World Health Organization and the Food and Agriculture Organization.

Such an attack combines several programs to which the member nations of the two organizations have given top priority. These include improvement of nutrition through increased food production, and control of the widespread debilitating diseases, such as malaria, which afflict rural people in many fertile areas, and therefore hamper the development of food production plans proposed by the FAO.

Reports submitted to FAO indicate that by 1951, with average weather, world food supplies may reach the prewar level. Meantime the world's population has increased by at least 150 million and continues to gain at the rate of 20 to 25 million persons annually.

FAO Nutrition Conference in Montevideo. Some 60 delegates and observers from 19 countries and 8 international organizations attended the conference on Nutrition Problems in Latin America held in Montevideo, Uruguay, July 28 to August 6. Dr. Hazel K. Stiebeling, Chief of the Bureau of Human Nutrition and Home Economics, was U. S. delegate, with Dr. Harold R. Sandstead of the U. S. Public Health Service as alternate.

The major work of the conference was conducted in committees which studied specific problems and framed recommendations to guide governments, private institutions, and individuals in initiating and carrying out sound nutritional policies.

Recommendations which emerged from the discussions relate to the four major items on the agenda: (a) the nature and extent of problems of nutrition in Latin America; (b) practical methods for improving nutrition; (c) establishment of national nutrition organizations, their function and programs; and (d) the need for a regional nutrition committee in Latin America. The final report of these recommendations will be available as an FAO document.

The conference enabled nutrition workers in various countries to become acquainted with each other and afforded encouragement to persons working in the comparatively new field of food, nutrition, and agriculture.

New School of Public Health. The University of Pittsburgh has announced that a new graduate school of Public Health has been endowed by the trustees of Andrew Mellon for $13,600,000. The school, the most heavily endowed of its kind in the U. S., will be open to graduate physicians, nurses, dentists, and others trained for public health work and will concentrate heavily on research in the field of industrial health.

Dr. Thomas Parran, former Surgeon General of the U. S. Public Health Service has been named Dean of the new graduate school.

Public Health Workshop. A workshop in supervision was held at the University of North Carolina, Chapel Hill, from July 1 to 20, for public health nutritionists.

The program was planned to provide training for nutritionists with supervisory responsibilites who are employed by state health departments, and nutritionists who are being trained for such positions.

Subject matter for the workshop was divided into three sections: (a) the nutrition supervisor in the organization of the health agency; (b) the nutrition supervisor and program planning; and (c) the job of supervising.

Fields represented by consultants at the workshop included public administration, personnel management, public health administration, hospital administration, public health nutrition, nutrition research, health education, general education, public welfare, public health nursing, and agricultural extension.

Hospital Convention. The fiftieth annual convention of the American Hospital Association was held in Convention Hall, Atlantic City, from September 20 to 23.

On Tuesday, September 20 at the Claridge Hotel, the Honorable Lister Hill, U. S. Senator, was presented with a citation and inducted as an honorary member of the Association for his outstanding contributions.

At the banquet at the last night of the meeting, Joseph G. Norbey was inducted as President of the Association for the coming year.

Bertha Biltz, former Administrative Adviser, represented the A.D.A. at this convention.

Canadian Hospital Administrators' Meeting. Dietetics in connection with hospital administration was among the subjects discussed at the third annual convention of the Western Canada Institute for Hospital Administrators and Trustees which was held in Vancouver, British Columbia, October 4 to 9.

Rev. Father H. L. Bertrand, President of the Catholic Hospital Council of Montreal, Canada, was chairman of the Dietary Section of the meeting. Organization of a dietary department was outlined by Mary W. Northrup, Chief Dietitian for the King County Hospital, Seattle. Other speakers included Wing Commander Margaret Clark, Chief Nursing Officer for the R.C.A.F., who spoke on personnel relations in the dietary department; and Charlotte Black, Dean of Home Economics, University of British Columbia, whose topic was "Food Service and Patients."

Postgraduate Medical Association Meeting. The Interstate Postgraduate Medical Association will hold its annual assembly in the Public Auditorium at Cleveland, the week of November 9 to 12. The general chairman of the convention is Dr. David A. Chambers, President of the Academy of Medicine of Cleveland and of the Cuyahoga County Medical Society, Cleveland.

Included in the schedule of clinic meetings will be a discussion on "Diet in the Treatment of Hypertensive Disease."

Dr. Tom Spies of the Hillman Hospital, Birmingham, Alabama, and Head of the Department of Nutrition and Metabolism, Northwestern University Medical School, Chicago, is also on the program. He will speak on "Recent Progress in Nutrition." Another paper will be that of Dr. W. Philip Corr whose subject will be "Diagnosis and Treatment of Cirrhosis of the Liver."

Symposium on Yeast. Food scientists, technologists, manufacturers, and processors will meet in the Hotel Pfister, in Milwaukee, Wisconsin, on November 8, 9, and 10 to attend a conference on the subject of "Yeast in Feeding." The meeting is sponsored jointly by the Associates of the Food and Container Institute, the Brewers Yeast Council, the Yeast Industry, and the Quartermaster Food and Container Institute for the Armed Forces.

The purpose of this yeast symposium is to make available to food processors and food research personnel the most recent data and information relating to yeast and its suggested applications in foods for human consumption. Technical papers presented at the meeting will deal with such phases as yeast production, composition, nutritional aspects, and various uses for yeast products. The program is designed to include discussions on primary yeast, brewers yeast, and yeast derivatives.

ANA Sponsors Diamond Jubilee of Nursing. The American Nurses' Association will celebrate seventy-five years of nursing service in the U. S. in November. The Jubilee will be opened formally by a dinner at the Hotel Biltmore in New York, in honor of the memory of Linda Richards, America's first professional nurse.

Pearl McIver, ANA President, announced that the Jubilee will help to "focus public attention on the extension and improvement of nursing service to all through the improvement of schools of nursing, economic security for all nurses, adequate licensure laws, and more effective counseling and placement of both prospective students and graduate nurses."

It is hoped that the Jubilee will help in recruiting 40,000 additional nursing students.

International Book Exchange. A national bureau for international exchange of books between libraries and scientific and educational institutions of the U. S. and other countries opened in the Library of Congress on September 1. The organization, to be known as the United States Book Exchange, is a successor to the American Book Center for War Devastated Libraries, Inc. Materials

NEW! NEW! NEW!

17 x 11 inch Easy-to-use

CANNED FOOD NUTRITIVE VALUES CHART

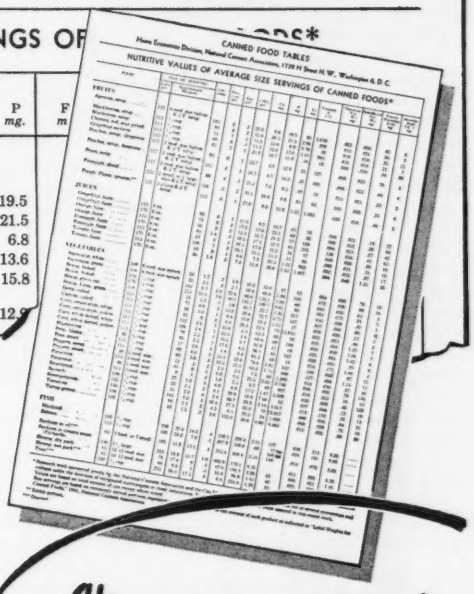
for average size servings

CANNED FOOD TABLES

Home Economics Division, National Canners Association, 1739 H Street N. W., Washington 6, D. C.

NUTRITIVE VALUES OF AVERAGE SIZE SERVINGS OF

FOOD	SIZE OF SERVING		Calories	Protein	Fat	CHO	Ca	P	F
	weight gm.	Approximate Measure		gm.	gm.	gm.	mg.	mg.	m
FRUITS									
Apricots, sirup	122	4 med. size halves & 2 T. sirup	105	.6	.2	25.0	9.8	19.5	
Blackberries, sirup	113	½ cup	95	.8	.2	22.4	20.3	21.5	
Blueberries, sirup	113	½ cup	51	.7	.2	11.5	12.4	6.8	
Cherries, red, sour pitted	113	½ cup	60	.9	.3	13.3	12.4	13.6	
Grapefruit sections	113	½ cup	87	.7	.1	20.9	14.7	15.8	
Peaches, sirup, clingstone	117	2 med. size halves & 2 T. sirup	95	.6	.1	22.7	3.5	12.9	
Peaches, sirup, freestone	117	2 med. size halves & 2 T. sirup	101	.6	.1	24.3			
Pears, sirup	117	2 med. [illegible]							



Giving nutritive values for 42 commonly used canned foods

Presented in gram weight and in practical measure

YES! A practical work chart for convenient and quick computation of diet requirements. Based on results of recent research on canned foods carried on at numerous universities and colleges under recognized nutritionists of those institutions.

A SECOND table supplies convenient information on servings per unit of various canned foods in common sizes of jars and cans. Helpful in planning menus and for marketing orders. Just fill out the coupon.

The NEW two-table chart is yours - - - free.

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NATIONAL CANNERS ASSOCIATION
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Please send me.....copies of the NEW nutritive values and servings chart.

Name.....

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City..... Zone..... State.....

Position.....

to be handled first will be limited to printed matter of scientific or literary character. Inquiries should be addressed to: U. S. Book Exchange, Library of Congress, Washington, D. C.

Library Material. The following material is available to A.D.A. members from the Loan Library: (a) *Educators Guide to Free Films*, 8th annual edition, published by Educators Progress Service, Randolph, Wisconsin; (b) *Diet Manual*, Sherman Hospital, Elgin, Illinois.

VA Manual. An excellent new diet manual—Part III of the Veterans Administration Manual M10-4, *Hospital Dietetic Service*—has recently been made available to all services in the Veterans Administration.

In it, "diet therapy" has been interpreted to mean the dietary care as a part of the medical care of *all* patients. On this basis the manual contains: general information regarding dietetic activites, routine hospital diets, modified diets, and miscellaneous diets. The appendix includes test meals, physiologic values of blood and urine, tables including the composition of foods and ideal weights for men and women.

In line with the modern trend, the classification of theraputic diets has been simplified. Dietetic terminology has been used in identification of the majority of diets, rather than the old mixture of terms derived from the various diseases or from the originators' names. On this basis, the number of therapeutic diets has been reduced to nineteen. Emphasis is given to the fact that the therapeutic diet is a modification of the normal diet and that the dietary treatment must be simple, practical, and economical.

For evaluating the adequacy of the diets presented, each one has been compared with the Recommended Daily Allowances of the Food and Nutrition Board of the National Research Council, and inadequacies are noted wherever any exist.

In order that revisions and additions can be conveniently incorporated, the manual has been prepared in loose-leaf form.

Although not available for general distribution, a copy of the manual has been placed in the A.D.A. Loan Library and may be borrowed by members.

New U.S.D.A. Publication. The Department of Agriculture has recently published a new booklet titled *Potato Preferences Among Household Consumers*. The findings are based on interviews with consumers on the buying of potato substitutes, the use of potatoes, and the influence of size, price, quality, and supply on purchase. This is miscellaneous publication No. 667 of the Department of Agriculture and was prepared by the Bureau of Agricultural Economics.

School Lunch Booklets. The Department of Agriculture has recently released four pamphlets dealing with various phases of school lunches. The first pamphlet is a revision of *A Yardstick for School Lunches* and includes information about school lunch programs, what they are, and why they should be evaluated. Suggestions are also given to leaders instituting school lunch appraisals. An outline for recording the appraisals is presented as well as source material, and appraisal forms for use in determining school and community interest in the program, and for physical facilities.

Estimating the Cost of Food for a School Lunch is the second pamphlet. It contains tables giving common units of purchase and their equivalents in weights and measures, as well as samples of a week's menus and a table of food costs for a week.

The third and fourth pamphlets are recipe booklets—*School Lunch Recipes Using Dried Whole Eggs* and *School Lunch Recipes Using Dried Fruits*. Both contain large quantity recipes to serve 100 portions. In each pamphlet the recipes can be cut out and added to a standard size recipe file.

Last year 13 million lb. concentrated orange juice; about 6½ million lb. nonfat dry milk; 5½ million lb. American cheese; 5 million lb. peanut butter; 22½ million lb. canned tomatoes; and nearly 16 million lb. canned tomato juice were distributed to the states for school lunches. Schools receiving these foods were all participants in the National School Lunch Program. These figures are evidence of the great volume of essential foods going to school children as a result of this program.

In addition, large quantities of fresh fruits and vegetables, canned fruit juices, and dried fruits were distributed for school lunches as a result of Department of Agriculture purchases in connection with the price support program.

School Children's Diets. Children who carry their lunches to school and miss the noon meal at home, thus often missing the main meal of the day, are in danger of running short on the foods they need for health, growth, and general wellbeing, nutritionists of the Wisconsin Experiment Station say.

Studies of the diets of rural school children made by Wisconsin nutritionists last year showed serious deficiencies. Green and yellow vegetables, milk, and citrus fruits and tomatoes were the three groups of essential foods in which many children were lacking. Studies were made of the food eaten by about 400 representative children in thirty-nine rural schools in two counties. One was a rich agricultural county of fertile soil, the other a county of light sandy soil. None of the schools attended by these children sponsored a school lunch program. The diet records were checked against the Basic Seven standard.

Diets of children in the county with fertile soil were somewhat better than those of the children in the sandy-soil area, but there were still serious lacks. In the rich-soil county 24 per cent of the children reported eating no green or yellow vegetables on the days when the records were kept; in the sandy-soil county 29 per cent ate none. Only 5 per cent in the fertile county and 3 per cent in the sandy area ate the recommended one serving a day of these vegetables.

Many children drank less than a pint of milk a day and some drank none while the records were being made. In the rich-soil county 31 per cent and in the sandy-soil county 53 per cent drank less than the minimum allowance of milk. Three per cent in each county reported no milk.

Blood samples of the children showed that a large number had low hemoglobin levels, indicating borderline anemia.

Data On Food Expenditures. "What the Public Spends for Foods and Other Items Sold in Food Stores" is the subject of a pamphlet released by the Topics Publishing Company, publisher of *Food Field Reporter*.

A table of food distribution channels shows that 37.09 per cent of all food distributed is sold in combination grocery stores, which include straight grocery stores and those handling meat as well; 20.78 per cent of food is distributed in eating and drinking places; and 10.36 per cent in specialty food stores. Farm consumption accounts for 4.57 of all food eaten, while the government and military services take 2.29 per cent. The remainder, which falls in the miscellaneous category, amounts to 24.91 per cent.

Also included in the report are graphs and breakdowns on various individual foods, including the percentage of each purchased and the total amount of money spent on each commodity as compared with sales and spending in the 1920's and 1930's.

Large Cranberry Crop. This fall the cranberry crop will be the second largest on record, according to the Department of Agriculture. In addition to the bumper crop, a large supply of processed berries—canned sauce and other products—have been carried over from last year's crop. Because of these abundant supplies, both fresh and canned, prices will be well below last year. Harvesting of berries reached its peak early in October and retail stores received large supplies for sale by the middle of the month.

Fine Flour From New Wheat Varieties. Flour from this year's wheat crop will be greatly influenced by two new wheat varieties, Comanche and Pawnee. These were developed cooperatively by the Kansas and Nebraska Experiment Stations and the Department of Agriculture and released to growers in 1943. The past five years has seen a rapid increase in their use. This year they were grown widely on Oklahoma and Nebraska farms and on more than 50 per cent of the Kansas acreage.

Cereal chemists report that both varieties are giving excellent baking performance. The wheats were selected for good milling and baking qualities as well as high yields and disease resistance.

Gerber's NEW Meats . . .

They're ARMOUR Quality Beef! Veal! Liver!

Delicious meats . . . with all the fine lean-meat flavor for which Armour is famous. Latest additions to the many good-tasting, nutritionally sound Gerber's Foods.

OUTSTANDING flavor, texture and color. Ready to serve.

HIGH QUALITY PROTEINS—specially selected cuts of Armour quality meats. Accepted by the Council on Foods and Nutrition of the American Medical Association.

READILY ASSIMILATED—strained or uniformly particulated. Gerber's Meats average *below* 4.5% for fat.

EXTRA CONVENIENT AND ECONOMICAL—*no scraping, no cooking, no waste.* Gerber's Strained and Junior Meats are *one* moderate price.

For complete analyses and additional data, write to Dept. 2311-8, Gerber's, Fremont, Mich.

Gerber's

FREMONT, MICH. OAKLAND, CAL.

3 Cereals • 20 Strained Foods • 15 Junior Foods • 3 Strained Meats • 3 Junior Meats

Tests used in measuring the baking performance of these varieties followed a standard pattern. Small lots of unbleached, experimentally milled flour were used for the trials. Ingredients were mixed in a mechanical mixer. The dough was rounded by hand and placed in fermentation bowls, where it was allowed to rise 1 hr. 45 min. It was then thoroughly kneaded and the kneading repeated when the dough had risen for another 55 min. and again after 25 min. The dough was then mechanically molded into uniform loaves, placed in baking pans, and allowed to rise for 55 min. at 86° F. It was baked 25 min. at 450° F. Flour from each wheat was rated for water absorption and time in mixing the dough. The bread was judged on the basis of size and weight of the loaf, and the color, grain, and texture of the cut bread.

Old Age and Nutrition. How the food people eat affects the characteristic changes of old age is a question now being studied by the California Experiment Station in cooperation with one county in that state and with state and federal agencies. About a thousand residents of this county who are fifty years or older and in apparent good health will be chosen to give their nutritional and medical history and receive examinations by physicians, biochemists, nutritionists, and laboratory technicians.

The aim of the study is to explore the ills of elderly people and determine the relationship between health and nutrition; to learn how to correct nutritional deficiencies; and to aid elderly people to keep in good health.

The results of the study may throw more light on what happens to people in aging and what inevitable natural changes are in contrast to changes caused by deficiency and degenerative diseases.

Buying Sweet Potatoes. "Whopping big" sweet potatoes, once exhibited with pride at county fairs, are not the best in the opinion of housewives, according to studies made by the Louisiana Experiment Station in grocery stores in five Louisiana cities and in Chicago and Pittsburgh. Shoppers observed in these studies generally considered size carefully in buying and chose the small or medium potatoes. When questioned, they explained that the smaller sizes took less time and fuel to cook and were more suited to individual servings. The big potatoes were too large for the average appetite.

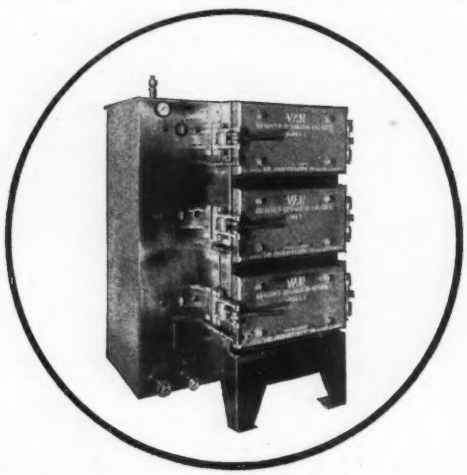
Prices affected choice, however. When all sizes sold at the same price, shoppers chose 94 per cent of the small and medium sizes and only 6 per cent of the large size. But when the price of the big potatoes was 2 cents a pound less than that of the smaller sizes, the buying shifted to 61 per cent of the large and 39 per cent of the smaller. Even though the cheaper price attracted customers to the big potatoes, they picked out the smallest from that bin, finally leaving only the extra large.

Cooking Applesauce. Although it may take more time to peel apples before cooking them for applesauce, studies at the New York State Experiment Station show that the flavor of the sauce is generally better. When apples are cooked unpeeled and then strained, the sauce may have a bitter taste from the peel.

Flavor and color both are better if the apples are cooked rapidly in a covered pan. Long, slow cooking destroys the delicate apple flavor and may darken the sauce. A tight cover on the pan helps hold some of the volatile flavor or bouquet of the apple.

News of State Associations

Illinois Dietetic Association. The dietetic interns of Chicago have recently formed an organization with Elizabeth Sears, of the University of Chicago Clinics, as their staff adviser. Two interns have been elected from each school to form the executive board. Betty Jacobson and Audrey Stoughton represent Michael Reese Hospital; Maxie Matte and Novine Rache, Cook County Hospital; Beverly Hallback and Cathy Cable, Hines Hospital; and Lois Burroughs and Yvonne Hodsdon, University of Chicago Clinics. Beverly Hallback has stated the aims and purposes of the organization as being to further public relations and to distribute vocational guidance material to colleges and high schools.



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Revolutionary
STEAM COOKER

● Not only is it automatically controlled by the door mechanism. The cooking operation in each compartment is also controlled individually by the use of electric time clocks so that the steaming period can be predetermined. No over-cooking. No baking after food is cooked. Every device that science affords insures safety of the operator and control of the cooking. Get the full facts in Bulletin S.

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EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD
DIVISION OF THE EDWARDS MANUFACTURING CO.
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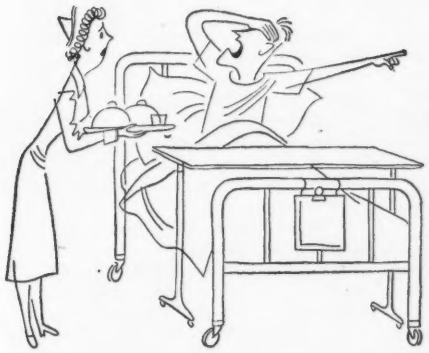
341 EGGLESTON AVENUE CINCINNATI 2, OHIO

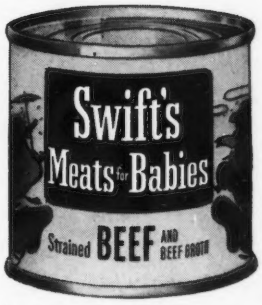


Soft Diet

trying your patients' patience?

— try palatable

Swift's Strained Meats



6 varieties

Tempting, natural source of complete protein

The things some patients on soft, smooth diets have to eat! It's no wonder appetites lag.

To perk up patients' interest in food, many doctors now prescribe specially prepared Swift's Strained Meats when soft foods are indicated in a high-protein, low-residue diet. They help two ways. *One,* Swift's Strained Meats taste so good. Few patients can turn down real meat goodness. *Two,* an excellent source of B vitamins, Swift's Strained Meats help restore patients' natural appetite for all foods.

Originally prepared for infant feeding, Swift's Strained Meats are soft, smooth (may easily be used in tube-feeding), slightly salted—cooked to retain all their delicious meat flavor. Six kinds for variety: beef, lamb, pork, veal, liver, heart. Each one 100% meat, they provide an excellent, palatable source of complete, high-quality proteins, and hemapoietic iron. These meats make available *simultaneously* all known essential amino acids . . . for optimum protein synthesis. Convenient—Swift's Strained Meats are ready to heat and serve.

The makers of Swift's Strained Meats invite you to send for your copy of "The Importance of Protein Foods in Health and Disease"—a physician's handbook of protein feeding, written by a doctor. Send to:

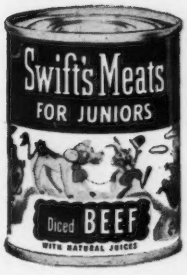
SWIFT & COMPANY

Chicago 9, Illinois

ACCEPTED COUNCIL ON FOODS AND NUTRITION AMERICAN MEDICAL ASSOCIATION

All nutritional statements in this advertisement are accepted by the Council on Foods and Nutrition of the American Medical Association.

For patients who can take foods of less fine consistency —Swift's Diced Meats offer tender morsels of nutritious meat with tempting flavors patients appreciate.



Kansas Dietetic Association. A new dietetic group was born on July 2 in Manhattan when twelve interested persons met to outline the program for the coming year. Carol Dornan, chief promoter and Instructor in Institutional Management, Kansas State College, was elected the temporary chairman. In addition to faculty and students at Kansas State College, Lt. Ruth Ramsey and two friends from Ft. Riley were present. It was decided that one of the important functions of this group should be to stimulate and maintain the interest of students in dietetics as a profession.

Minnesota Dietetic Association. The new officers for the Minnesota Dietetic Association for 1948–1949 include the following: President, Hortense Allen, Consulting Dietitian, Mayo Clinic, Rochester; President-Elect, Alice Biester, Division of Home Economics, University of Minnesota, Minneapolis; Secretary, Lucille Foss, Eitel Hospital, Minneapolis; and Treasurer, Sister M. Bernadette, Department of Foods and Nutrition, College of St. Teresa, Winona.

Home Economics students of the local high schools were invited to attend the April meeting of the *Rochester Dietetic Association.* Honored guests were Jeanette Kelley of General Mills' Betty Crocker staff and Ellen Pennell of the Home Service Department of Pillsbury Mills. Miss Pennell gave an interesting talk on "New Trends in Food," covering the developments in flour and flour products, frozen foods, and quicker methods of manufacturing foods.

New Jersey Dietetic Association. The annual meeting of the New Jersey Dietetic Association was held on November 2, at Woodlawn, the Alumnae House at New Jersey College for Women. The meeting, an afternoon one, featured John B. Kennedy, noted columnist and radio commentator, and was followed by a buffet supper.

A "school for cooks" was held for two weeks during the summer at New Jersey College for Women. The school, designed to teach the basic fundamentals of correct cookery processes to the cooks in school cafeterias, was under the direction of Helen Hazen, Director of Home Economics at the College, and Janet Jardine, Supervisor of the state's school lunch program.

Oklahoma Dietetic Association. A scholarship award of $100 to dietetic interns has been approved by the Oklahoma Dietetic Association. The plan is to award $100 to an outstanding second semester college senior working toward a dietetic internship. The award, is to be made to the student in cash, one half after one month of her internship and the second half at the end of her sixth month as an intern. The colleges in Oklahoma are to send their nominations to a committee for selecting the recipient of the scholarship. Each college is to be allowed one nomination and an additional one for each six graduating students majoring in dietetics, beyond six.

The quarterly publication of the Oklahoma Dietetic Association has recently been renamed and its format revamped. The bulletin is now called *The Sooner Dietitian* and sports an attractive colored cover with the map of Oklahoma on it.

At its meeting on May 17, the *Oklahoma City Dietetic Association* elected the following officers for the coming year: President, Bonnie Sewick, Crippled Children's Hospital (University Hospital); Vice-President, Elizabeth Hensler, Cafeteria Manager, Oklahoma Publishing Company; Secretary, Fredericka Dale, State Capitol Cafeteria; and Treasurer, Frances Berry, Oklahoma Natural Gas Company.

Speaker at this meeting was Dr. Ritzman of the Department of Speech Correction, University of Oklahoma, who spoke on the connection of speech difficulties with child psychology. The final meeting of the year was held in June and took the form of a picnic.

Tulsa dietitians had a dinner meeting at the Sky Chef Restaurant, Tulsa Municipal Airport, on May 5. Eleven dietitians were present, and several members of the Cafeteria Department of the Board of Education were guests. The group voted to express its interest in the establishment of courses in home economics at the University of Tulsa, and a letter in this regard has been sent to Dr. C. I. Pontius, President of the University.

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NEW Mix PRE-MIXES
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Today it's possible—and profitable for services as low as 50 persons daily to include premises-baked, oven-fresh cakes, pastry, rolls and desserts.
MADE FROM READY MIXES
Prepared pie-crust, layer, ginger bread, basic sweet dough, biscuit, muffin and roll mixes, together with prepared fruits (frozen, canned, dried) provide scientifically controlled materials, with easier pre-tested recipes, to facilitate labor-saving preparation of baked goods, even with limited staffs.
BAKED IN BLODGETT OVENS
Twenty-four models of baking ovens; loading capacities from 6 to 48 10" pies. Nationally famous for their operating simplicity, even-heating and superior performance, they provide "tailor-made" installations to fit any requirement, large or small.
Blodgett BAKE OVENS
ONE HUNDRED YEARS OF
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CHIQUITA BANANA SAYS:

For two great foods in one

BANANA MILK SHAKE

Easy to make

For milk shakes—bananas fully ripe flecked with brown.

How to make BANANA MILK SHAKE

1 fully ripe banana **1 cup (8 oz.) COLD milk**

Peel banana. Slice or break into container of an electric mixer. Add milk and mix until creamy. Serve immediately. Makes 1 large drink (10 to 12 ounces) or 2 medium-sized drinks (5 to 6 ounces each).

When using a mixer which does not cut up and crush fruit, mash the banana before placing into container of mixer.

For a COLDER drink: Add about 2 tablespoons of crushed ice before mixing.

For a RICHER, SWEETER drink: Add about 2 tablespoons of ice cream before mixing.

Banana Milk Shake separates when allowed to stand...therefore serve immediately.

Banana Milk Shake is a "pep restorer"...good for everyone. It is of special value in post-operative and convalescent diets. The Banana Milk Shake contains approximately 260 calories.

VARIATIONS

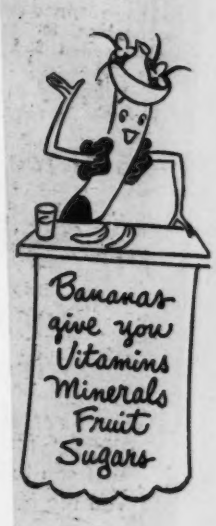
Banana Egg Nog: Before mixing Banana Milk Shake, add 1 egg.

Banana Malted Milk Shake: Before mixing Banana Milk Shake, add 2 to 3 tablespoons (½ to ¾ ounce) malted milk powder.

Banana Chocolate Milk Shake: Before mixing Banana Milk Shake, add 1 to 4 tablespoons (½ to 2 ounces) chocolate syrup.

USE FULLY RIPE BANANAS ... PEEL WELL FLECKED WITH BROWN

Easy to take



Good to drink

Home Economics Dept., UNITED FRUIT COMPANY, Pier 3, N. R., New York 6, N. Y.

...and don't forget—
5 teaspoons of fruit sugar in every ripe banana

For bland diets, fruit diets, high carbohydrate diets—Bananas

Pennsylvania Dietetic Association. The first meeting of the *Philadelphia Dietetic Association* was held at Friend's Hospital on September 21. Announcements were made of all the new committee members and those not serving in any capacity were asked to register for group work after the meeting. The Association has found this an excellent way of encouraging new members to participate in Association activities and to become acquainted with the work being done in the city, as well as forming new friendships.

Pennsylvania Week was observed beginning September 27, and the Centennial Celebration of the Pennsylvania Medical Association followed on October 2 at Gimbel Auditorium. As a result of last year's public relations program the Philadelphia Dietetic Association was requested to provide an exhibit for both occasions and since an attendance of 50,000 was expected, it was considered an excellent opportunity for further public relations and vocational guidance work. The exhibit combined vocational guidance material and a display entitled "One Hundred Years of Progress in Nutrition." A revolving disc carried small figures bearing banners marking new discoveries and trends in the nutrition field. It is hoped than an exhibit committee will be formed to make permanent equipment which will be available for such occasions in the future. During these two special weeks two radio interviews were scheduled to bring information to the public and to invite them to the exhibit.

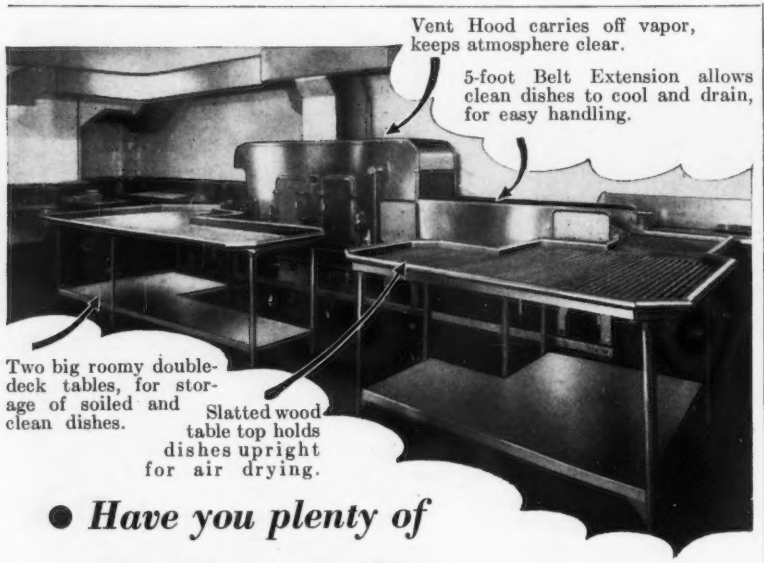
The Philadelphia Association has again issued an attractive printed program of the meetings for the entire year, and for a second year they are planning to invite allied groups to be their guests at various meetings. Among the groups to be invited are: home economics students, visiting nurses, public health nurses, medical students, directresses of nurses, members of the Philadelphia Metabolic Association, and hospital administrators. Programs for the various meetings will each highlight one topic. One meeting will deal with diet in maternal health and another with public relations, in addition to those meetings which will be turned over to the four sections of the Association.

Washington State Dietetic Association. The Washington State Dietetic Association held a two-day convention in May. Members of the Oregon, Idaho, Nevada, Montana, and Vancouver, British Columbia, Dietetic Associations were guests. This first annual meeting emphasized subjects on administration. Theodore J. Barnowe, Assistant Professor of Personnel Management, University of Washington, spoke on "Administration and Human Relations." This was followed by a talk on "Food Cost Control" by Doris Parks, Business Manager of University Dining Halls, University of Washington. A demonstration of cutting of new food products was also given.

Mary P. Huddleston addressed the group at luncheon on Friday on the subject, "Writing for Publication." The afternoon program included Dr. Thomas P. Geraghty on the subject of "Relation of Diet to Allergy." At the business meeting E. K. Grady, of the J. Walter Thompson Co., spoke on the A.D.A. public relations program. Tea was served in the Swedish Hospital's new Eklind Hall with Ruth E. Forsberg as hostess.

Members spent the evening aboard the 115-ft. yacht, *The Sueja*, cruising on Lake Washington while they enjoyed their picnic supper.

Saturday the meetings at the University of Washington included a panel discussion headed by Margaret Terrell on "Quality Food Production." "Food Needs of the Consumer" was presented by Louise Powley, Head Dietitian of the Virginia Mason Hospital. Martha Dressler of the University of Washington presented "Scientific Techniques in Food Production." Nena Osterud of the King County Hospital, Valine Mietzner from the University of Washington, and Virginia Priem, Director of School Lunches, Seattle Public Schools, presented the various aspects of the subject, "Application of Approved Techniques in Institutional Food Production." Carolyn Murphy, Research Dietitian, University Commons, University of Washington, talked on the testing of large-scale recipes. The convention concluded with lunch at the University Commons. Dr. Edith Buxbaum, Psychoanalyst, Northwest Clinic


Vent Hood carries off vapor, keeps atmosphere clear.
5-foot Belt Extension allows clean dishes to cool and drain, for easy handling.
Two big roomy double-deck tables, for storage of soiled and clean dishes.
Slatted wood table top holds dishes upright for air drying.

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***for a Dish Washing Layout that gives* Maximum Convenience *and* Lowest Labor Cost?**

If you have room for it, a layout like the one above will give you the Most Efficient and Economical dishwashing obtainable.

Dishes are fed directly onto a bakelite belt, with an extension at the clean-dish end for cooling.

We also build a complete line of Door-Type and Automatic Rack Feed machines. Every Champion is built with extra strength at all critical points; write for catalog.

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of Psychiatry and Neurology, spoke on "Food and Its Psychological Importance."

Dates for the fall meeting in Seattle are set for November 5 and 6 to enable delegates to report promptly on the A.D.A. convention in Boston and to initiate the program for the coming year. The two-day program will provide ample variety to cover the interests of all. Such topics as "Electronics in the Kitchen," "Clinical Use of Radioactive Isotopes," and "Reconstruction in Germany" promise an interesting meeting. Mayor Devin will be the luncheon speaker emphasizing the importance of community responsibilities. The dinner will be held at the Seattle Tennis Club where W.A. Hunter will speak on "Game in Washington."

Wisconsin Dietetic Association. The *Milwaukee Dietetic Association* held its first meeting of the year on October 6 at Jacobus Park Lodge. Following the dinner, Dr. Maurice Hardgrave, Assistant Clinical Professor, Marquette University, discussed "The Newer Concepts of Diabetes Mellitus." Dr. Hardgrave explained the current theories of the etiology, treatment, and prognosis of the disease.

An open meeting to which all home economists are invited, has been planned for November. This is an attempt to bring more active cooperation between home economists in all phases of the profession.

The officers of the Milwaukee Association for this year are: President, Ruth Humbolt; Vice-President, Dagmar Toumin; Secretary, Margaret Krouser; and Treasurer, Elizabeth Bice.

Association Activities

Vocational Guidance by Example. Good Samaritan Hospital, Portland, Oregon, accepted three college students for summer work in the Dietary Department this year. Each student was oriented in the department as well as to the hospital as a whole, and then given two or three assignments in the department to enlarge her experience. As opportunities arose, the staff dietitians talked to the students regarding the work of the department and the profession. Toward the end of their summer work, a tea was given in the students' honor, at which there was an opportunity again to talk with them about their work and interest in dietetics.

New Committee Member. Alice Biester, of the University of Minnesota, has accepted an appointment as a member of the A.D.A. Vocational Guidance Committee.

A.D.A. Cooperates with WMSC. In October a mailing went out under A.D.A. letterhead to all presidents of state and local dietetic associations telling of the national association's plans for cooperating with the Army in procuring a sufficient number of dietitians to meet the needs of the expanding Army and Air Force.

The Army has developed a plan of community action by which it hopes to procure volunteer medical personnel. According to this plan, Military Manpower Committees in cities and towns, composed of civic leaders working on a voluntary basis, will help in this recruiting problem. Some 600 such Committees are now organized. It is planned that a Medical Sub-Committee for each of these Manpower Committees will be formed, and it is hoped that an outstanding dietitian in each community will serve on this Sub-Committee. In addition, the Army Medical Department is forming Military Medical Personnel Procurement Committees within the military organization of the six Army areas and the thirteen General Hospitals. Liaison between these committees and the civilian Medical Sub-Committees should provide an effective means of meeting procurement goals on a voluntary basis. Along with the letter sent describing this program of action were folders describing the organization and goals of the program and sheets containing suggestions for implementing the program.

Oklahoma Public Relations Activities. In Oklahoma City a set of Kodachrome slides has been made for use with a story which will be part of an exhibit on dietetics. Although done by Oklahoma City dietitians, the Oklahoma Dietetic Association has allocated funds to defray part of the expense, and when the project is finished, the pictures will be available for use anywhere in the state.

The Oklahoma City Dietetic Association has also undertaken a project of providing vocational guidance pictures to local organizations and groups. Under the chairmanship of LaVon Thompson, arrangements have been made for a traveling bulletin board which will fold up and can easily be carried by a handle.

Other activities in Oklahoma this year have included an exhibit at the Oklahoma Education Association meeting in February in Tulsa; an exhibit "manned" by dietetic interns from Oklahoma A. & M. College at the Future Homemakers of Oklahoma Rally in April, and a broadcast over station KSPI by two interns from Oklahoma A. & M. College on "Dietetics as a Profession."

Activities in Nevada. Although Nevada has few dietitians and is hence unable to have an association, nutrition work has been carried on for some years. The state school lunch supervisor, the University Home Economics Department and Extension Service, the State Vocational Home Economics Department and Public Health Association are working together to further good nutrition throughout the state in homes and schools. Local groups keep in touch with regional projects and take part whenever possible. In August, a school lunch workshop was held on the University campus in Reno. Here the cooks refreshed their knowledge of the daily needs of the body when Dr. Penelope Burtis Rice gave illustrated talks.

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